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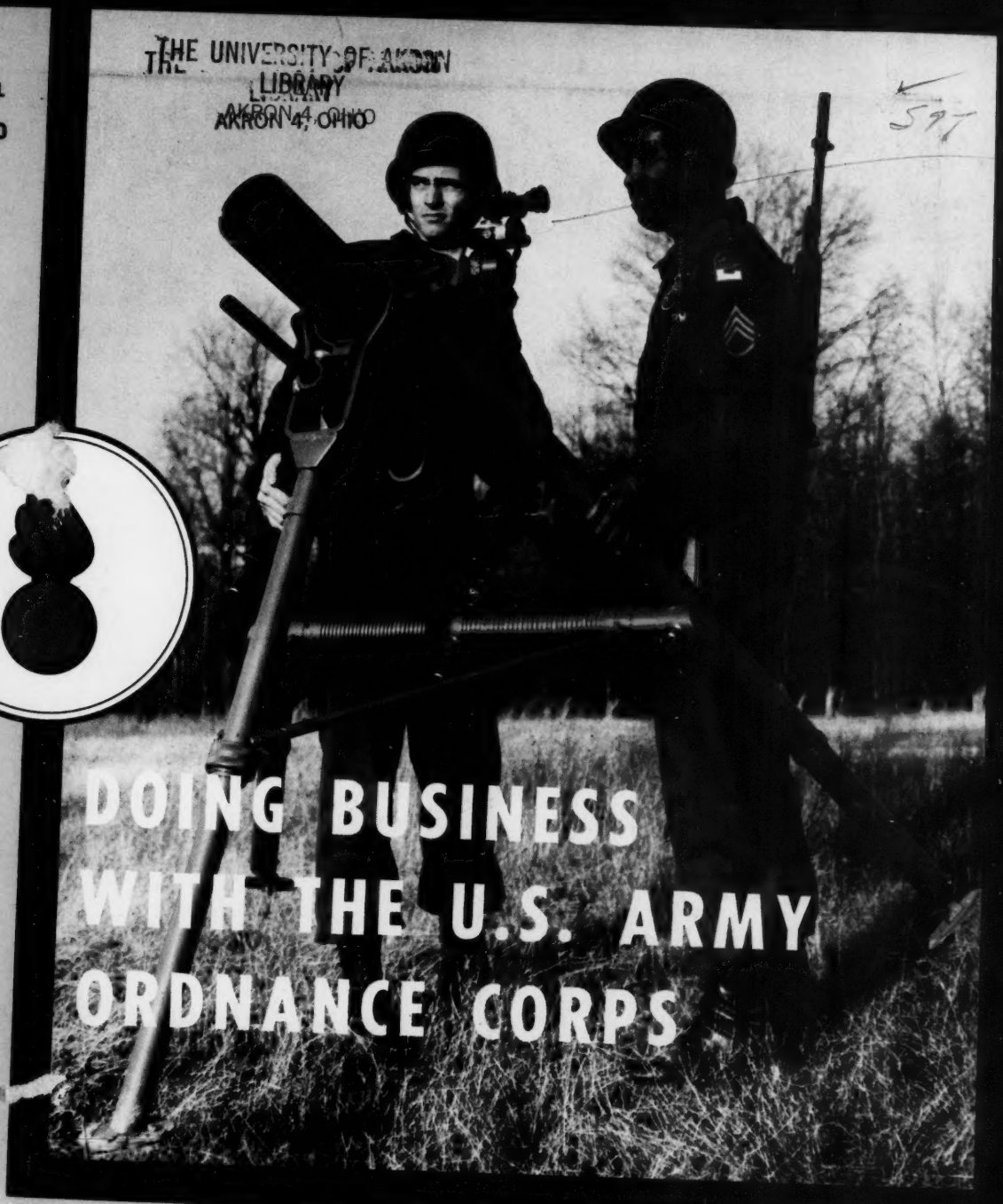

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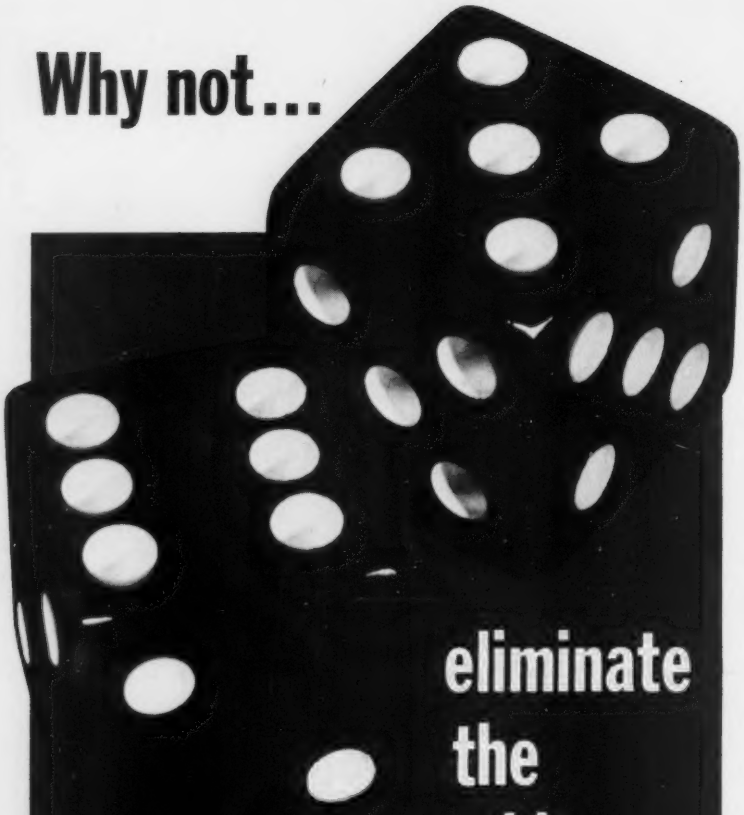

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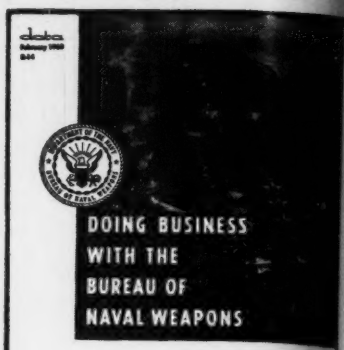

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Mar.	NASA
Apr.	Navy Supply System
May	Army Ordnance
June	Air Materiel Command
July	Navy ASW Program
Aug.	Navy Astronautics Program
Sept.	Army Signal Corps
Oct.	Army R&D Program
Nov.	Mutual Security (ICA) Program
Dec.	Dept. of Defense

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Army's new DAVY CROCKETT atomic weapon is shown in this photo, the first released picture of the weapon.

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Feature Editorial

THOSE CLIPPED ARMY WINGS

CAIDIN

by Martin Caidin/DATA

Despite the best of intentions on the part of the Air Force, the United States today suffers a severe anemia in tactical combat airpower. The budget cuts are inexorable, it seems, and the Air Force is left with no choice but to make decisions that wield sweeping cuts within its own organization. When you're faced with the prospect of reducing your ranks in intercontinental-ranging bombers, or fighter airplanes intended essentially to be used on tactical missions—and more specifically for direct ground support—the end result is rather inevitable. You chuck out the bulk of your tactical airpower; you strip it to its barest bone, and continue building your heavyweight equipment.

The Navy isn't in bad shape at all when it comes to tactical airpower, because it has an air fleet of superb machines for this purpose. The Douglas team—the deadly duo—of AD piston-engine bombers and the A4D jet Skyhawks, give USN outstanding close-attack machines. And there are many others, flying with reciprocating, turboprop, and turbojet engines in Navy and Marine colors that mean excellent tactical airpower.

That's fine for the Marines, and sometimes for the Army, if the Navy can get around to providing support when and where the Army will need it. But *sustained* tactical air support is vital, not just a few heavy blows. Whether Navy can meet its own problems, plus those of Army, is not only doubtful, but impossible.

We aren't at that situation yet, because there is some tactical airpower around in the form of fighters and light bombers, but the Army woefully sees the time coming when it simply will not have *any* effective attack airpower to support its operations. It doesn't like this situation, and not simply because a man in an Army uniform isn't passing on the signals. They don't like it because the cost for such deficiency is invariably exacted in blood—that of Army soldiers.

Now the Air Force has its F-100 fighter-bombers, and these are outstanding weapons. The newer F-105 is a flying powerhouse, but is it—or the F-100—truly *tactical* airpower in the Army's sense of the word? Not at all. Just read the official description of TAC, and you'll see accurate and glowing descriptions of *strategic capability*. The inference is not made that these fighter-bombers can work over front-line positions, but that they can do anything a B-52 can do, and a hell of a lot better if you ask the Super Sabre and Thunderchief pilots.

When you talk tactical airpower in the Army, you refer to a flying powerhouse, a weightlifting slugger that gets in there close with napalm, bombs, rockets, cannon and rocks, if need be. An airplane with staying power, and that can take punishment—like the fabled Thunderbolt of World War II. The F-100 is such an airplane, but there aren't enough F-100's, and precious few F-105's, besides, USAF needs these for the really long-range strikes against the airfields and selected targets in the enemy's homeland.

In respect to our tactical airpower, we are critically weak, and the situation continues to grow worse. The Army is screaming for major tactical airpower that means something. It *needs* that airpower, badly. It doesn't have it, and its not likely—under present official attitudes of multi-million dollar space boosters and so forth—to get what it needs to fullfill its mission.

So, it is simply not equipped adequately to fight tactical wars. What's available from the Air Force isn't available in sufficient number, and even if it were, this continuing split command still costs lives. I asked many Army commanders about their experience in Korea in respect to tactical air support. The answer rarely different: "We received excellent support—the Air Force gave it everything they had. But too often it was too late and too little, and we left some people over there that should have come home."

The problem no longer revolves about who shall sit in the highest chair of all and dictate policy. The Army needs powerful combat tactical airpower. It is permitted by law to get that airpower only from the Air Force. But USAF in turn has its budgetary woes, and its sights are set on the moon and beyond, not over the next hill.

Ergo: so long as the present situation in respect to missions and roles continues, the Army simply won't have that airpower. Comes the next brushfire war or two, and we are going to leave a lot more people "over there" instead of welcoming them home.

—MARTIN CAIDIN

MISSION RELIABILITY

Back of some future firing line, helping to ensure that each U.S. Army "Sergeant" missile fulfills its mission will be the Field Maintenance Test Station — FMTS.

The thousands of tests necessary to assure reliable missile flight will be performed automatically and speedily by this Sperry-engineered automatic test equipment. The testing of missile assemblies and replacing of failed subassemblies with factory-perfect spares will be quickly and accurately accomplished by a semi-skilled operator. Thus, the maximum number of weapons will be ready for issue to the artillery battalion.

Simple to operate and easy to maintain, FMTS was developed around basic Sergeant system concepts.

MOBILITY — Complete FMTS test equipment is housed in a single van with a gross weight of less than 16,000 pounds. Completely self-sufficient the FMTS can be quickly transported by sea, surface, or air for immediate support of the Sergeant.

RUGGEDNESS — FMTS is solidly constructed to operate in all environments. Assemblies are sealed for protection and bolted to aluminum racks hard-mounted to the enclosure structure. Whatever the conditions of terrain whatever the extremes of weather, the Sergeant will have FMTS backup.

DEFENDABILITY — FMTS dependability is built-in through the use of simplified circuits, test-selected components, and transistorized electronics. Reliable test results are assured since FMTS conducts a continuous self-test while in operation and any internal failures are immediately indicated.

Rapid and accurate automatic testing by the FMTS combined with easy and simple maintenance procedures will help guarantee the mission reliability of the Sperry produced Sergeant, now under development.

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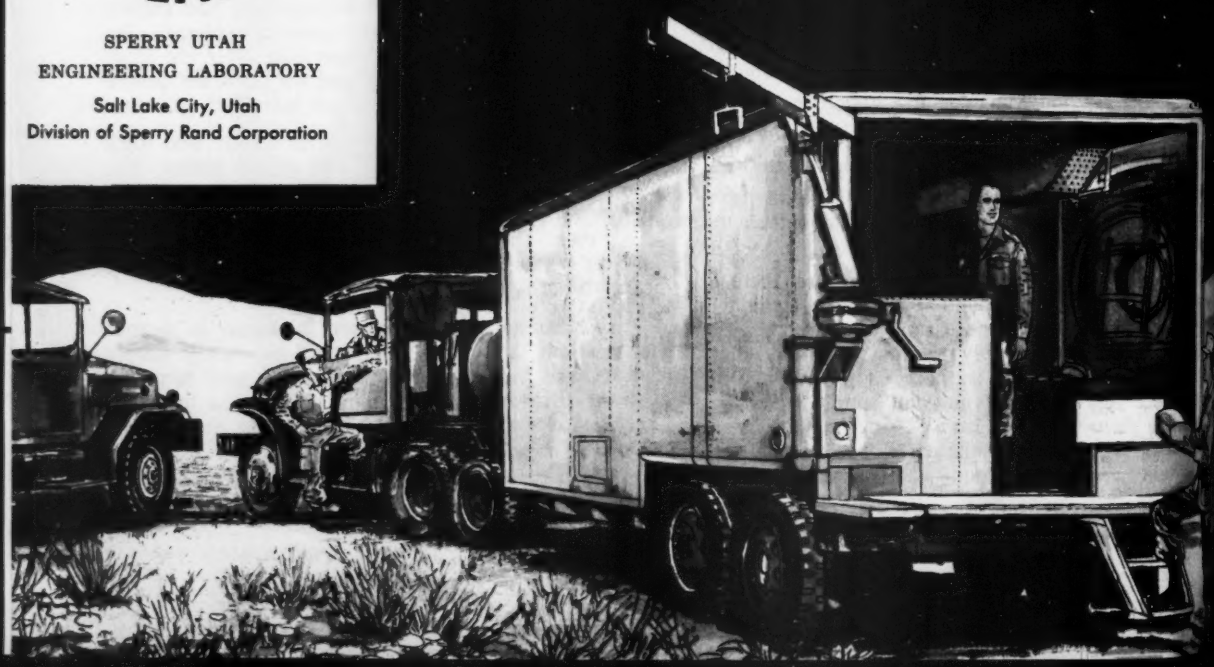

Mission of the U. S. Army Ordnance Corps

To develop, provide and service ordnance materiel. This is done through functions identified at national, support and special missions:

1. The national missions are—national development, national procurement and production, national industrial engineering, national industrial mobilization, national supply control, national stock control and national maintenance.

2. The support missions are—development support, industrial engineering support, manufacturing support and maintenance engineering support.

3. The special missions include, but are not limited to: research and basic production engineering investigations.

Ordnance Budget

This is the way Army Ordnance will spend its money for FY '61:

Production	$1,361,000,000
Operation and Maintenance	518,400,000
Stock Supplies	204,700,000
Research & Development, Testing and Engineering	680,400,000
Construction	400,000,000
Foreign Military Aid Program	250,800,000

Ordnance Interests

Army Ordnance is interested in the procurement of literally thousands and thousands of different items—actually and factually, more than 300,000!

Listed herewith are just a handful to give you an idea of the wide range:

Motor scooters, trailers, tires, tubes, batteries, motorcycles, trucks, automobiles, tractors, tanks, machine guns, ammunition clips, artillery carriages, recoil mechanisms, sea-coast targets, pistols, rifles, optical instruments, watches, lubricants, packing and gasket materials, repair shop equipment, measuring tools, mortars, fire control equipment, launchers, preservatives, antifreeze, and missiles.

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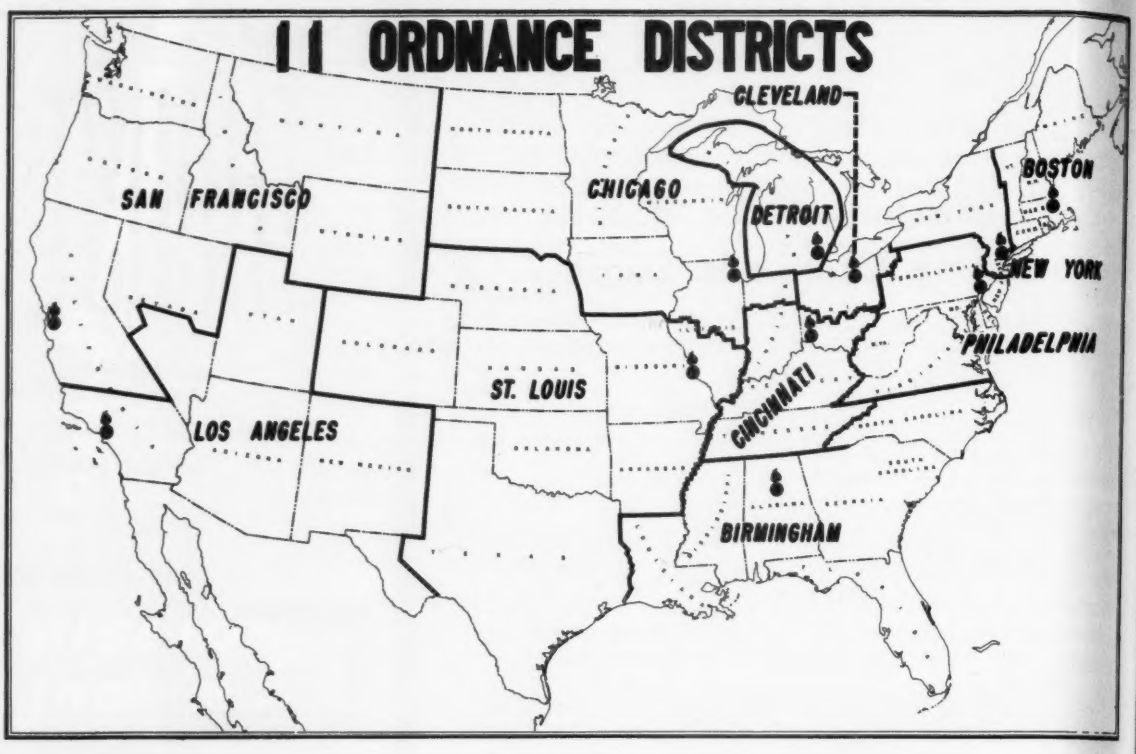


The Big Picture of Army Ordnance

MOST MAPS and charts of the United States divide up the country on a North-South or East-West basis. Or it may be the longitudes and latitudes, time zones or mountain ranges that are featured. Or it could be a simple map, with simply the individual States given demarkation.

But there is a certain map that hangs on several of the walls of the Pentagon that divides the nation into 11 different portions in a seemingly most arbitrary way, without apparent regard to any particular rhyme or reason.

Nevertheless, haphazard as all this may appear, it is quite an important map; as meaningful a one as you'll find anywhere around the Pentagon.

What this map does is apportion the nation into ordnance districts. And, if you're interested in doing business with Army Ordnance (and you'd be crazy not to), this is a very important fact of life for you.

It's just like you're born rich or poor, a girl or a boy, in a Democratic or Republican district . . . there may not be a heck of a lot you can do about it but they're matters worth bearing in mind anyway.

For the ordnance district in which you happen to be located determines the way you go about doing business with the Army. With the Ordnance Corps anyway—and that, today, is definitely the big procurement arm of the Army, handling as it does some 302,000 items, everything from a small land vehicle battery to a complete space missile.

Let us assume that all this but whets your appetite, you're convinced you're just the fellow who can come through for the Army in a big way, but things look a little fouled up to you. Here you are, let us say, with your concern in Bayview, N. J., a stone throw from Philadelphia, but the map shows you're in the ORDEH district, which means that the Ordnance office is in New York City, which is many scores of miles away and a nuisance to reach. Really, why can't you just go into Philadelphia, for once do the simple, sensible and direct thing, even if it is the Government?

Well, the reason is that there has to be some sort of arbitrary dividing line when the country is being apportioned for administrative rather than purely geographical purposes. And, if it's any consolation, there is a certain amount of logic to the Ordnance set-up. Originally, it was patterned after the Federal Reserve district, also the "natural" groupings of the nation's business coloration, which was based back then to a large extent on the railroad situation.

Today of course the railroad influence doesn't play as strong a part and modifications of the Ordnance districts set-up is made from time

to time. The Carolinas, for instance, used to be in the Philadelphia Ordnance district, now are under the Birmingham office jurisdiction. Right now, Memphis area business men would like to get their Ordnance jurisdiction changed from Cincinnati to Birmingham.

The bright side to the Ordnance districts arrangement though, even if it may happen to be inconvenient for you, is that it need be only a matter of "touching base". Once you've done that you can make your other contacts whatever Ordnance Command, Arsenal, Proving Ground, Depot, or other Ordnance establishment with whom you are directly interested in doing your business. The reason it is important though to make at least the initial contact with your Ordnance district office—indeed, it is really indispensable that you do so—is not only that this office probably will actually wind up making or administering your contract, but you can't get one without it. Your district Ordnance office makes the pre-award survey and gets you your necessary security clearance.

And something else: Even though the Ordnance office in your district is likely to be more familiar with the Ordnance needs and situation of its particular area, it also can properly advise you whatever your product or idea may be. You may be told you should go to some other Ordnance establishment, but you can be sure you are being steered on the right track.

You'll find the Ordnance people may be tough-minded about what they want but they're nice people to do business with. Perhaps no other branch of Government is quite as anxious to make solid alliances with business and industry. The reason is that the Ordnance people are not only concerned with the immediate needs of the Army but must also take into consideration all sorts of emergencies, including the rather drastic one known as war. Just as Defense Department's manpower planners must concern themselves with how to mobilize the nation's fighting forces in time of national peril, Ordnance has the responsibility of mobilizing the industry that will supply the hardware and equipment needs of these men.

If you can persuade Ordnance that you can supply it with some things it needs at the moment, well and good. But if you can also, while you're at it, convince Ordnance that you can become part of its "Mobilization Team", ready to come through for it in time of any emergency, then so much the better. Ordnance is bound to regard you with additional approval.

Of course, there has to be more than desire and willingness involved here. The Ordnance people will want to have a look at your plant to see if you have the facilities for doing the job.

If Ordnance feels that you can do a job for them, whether it's turning out rims or rockets, it will make due note of this and you'll be kept in mind whenever the occasion arises for making a contract for this product, whether it's the advertised bid or negotiated variety.

If you're the kind of person who, even though you've got up an attractive and factual brochure about your plant and ideas, would nevertheless like to discuss in person some pet notion of yours with some Ordnance expert, that can be arranged. The Ordnance Corps makes it plain that it welcomes any new ideas for weapons and material. If it's an R&D idea, some brand new concept, then you'll almost certainly get a negotiated contract, without the bother of facing up to competitive bids, if your idea wins favor.

But Ordnance issues this warning: "There are rather frequent cases where costly voluntary efforts to interest the Army in something ends in disappointment because the ideas are not always sufficiently compatible with the various factors which must be considered by the Army."

In other words, what to you, as a layman, may seem like a natural for the Army, may have some obvious flaws from the professional military point of view. So before you get yourself too much involved in something that might turn out to be a dud of the first water, it wouldn't be a bad idea to make contact with your Ordnance district office. Have a heart-to-heart talk with the people there and, if possible, get registered in their qualitative development requirement program which establishes for you a flow of information concerning things the Army would like to have developed. Any U.S. firm which indicates an interest, has a suitable R&D capability, and possesses the necessary security clearance; is in a position to obtain this information. It should be a big help in bringing the company into full swing with Ordnance procurement activities. If you qualify, you probably will be invited to attend briefings as well as receive documents.

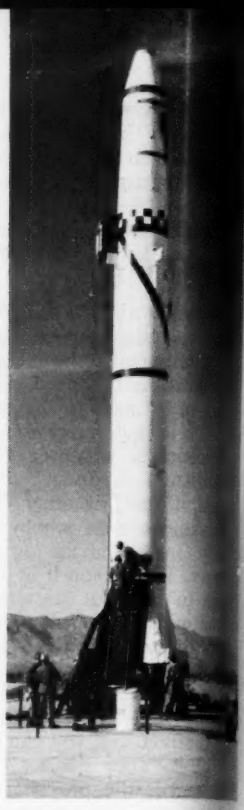
Each of the 11 Ordnance districts is in the charge of an Army officer, usually a colonel, but there is a civilian counterpart too. It is a Board of some of the leading industrialists, bankers and businessmen of the area who do not, themselves have any interest in Ordnance procurement. If the Army officer in charge of the Ordnance district has some misgivings about the awarding of a contract, whether some concern is properly qualified to handle some matter, or something of that sort, the Board may be called in to furnish recommendations on the matter. These Boards have a reputation of being public spirited and fair.

The Ordnance Corps is proud of the fact that it consists of "the biggest business in the Army" and has "hundreds of customers". Under the single management idea, it makes itself responsible for obtaining Ordnance material of all types for the Navy, Marine Corps and Air Force . . . and, as a matter of fact, it also helps with the procurement of Ordnance materiel for foreign aid programs.

Ordnance policy is to give R&D contracts for an entire missile system to one prime contractor. But Ordnance offices keep up with the needs of the prime contractors and try to channel potential subcontractors to the primes who could use their services or products.

Advises the Ordnance Corps:
"The smaller company would do well to concentrate on superiority of individual components so that their reputation for reliability, superior performances and better cost will lead prime contractors to their door."

But whether it's "components" or the "main drag", the Ordnance people are a worthwhile bunch with whom to become involved—and it can all begin with a visit to the Ordnance office in your Ordnance district. ■



Rocket City, U.S.A.

A Story of the Army Redstone Complex

AN OLD HUNTSVILLE, Alabama, statute stated that no kite could be flown, a woman ride a bicycle or a cannon be fired within city limits.

Today this town is somewhat less conservative. It proudly calls itself simply, ROCKET CITY, U. S. A. —"The City With A Zooming Future."

In Army and Department of Defense lingo though, the establishment dedicated to the proposition of the propagation of bigger and better missiles is known rather phlegmatically as AOMC-ARGMA-ABMA.

Given a little more flesh and blood, this means Army Ordnance Missile Command, Army Rocket and Guided Missile Agency and Army Ballistic Missile Agency.

Most people, being neither Pentagonites or Huntsvilleophiles, simply refer to this area as Redstone, after its simple arsenal designation.

Which is no doubt all right, being as this is a free country, but most people who use the term Redstone Arsenal, probably have no idea that they are refering to what is in fact a triple operation.

Anyone truly interested in U. S. missile production should have some basic familiarity with the Redstone set-up though. Briefly, this is the way it is:

The U. S. Army Ordnance Missile Command is concerned with the overall Army missile production, the present situation as well as what lies ahead. Its program and range of interest includes the entire family of Army rockets and missiles, from the anti-tank DART to the satellite-launching JUPITER.

Army Rocket and Guided Missile Agency has the responsibility of research, development, procurement, production, industrial engineering, industrial mobilization, maintenance and repair of part supply and stock control of Ordnance rockets and guided missiles. It also is assigned special missions involving JATOS, aerial target drones and rockets other than strictly of the Ordnance variety. It has directed the development of such Army weapons systems as the surface-to-surface SERGEANT, CORPORAL, DART, HONEST JOHN, LITTLE JOHN and LACROSSE and surface-to-air HAWK, NIKE-HERCULES, NIKE-ZEUS.

The Army Ballistic Missile Agency is America's first and only agency created exclusively for the performance of technical service responsibilities for long range ballistic missile systems. This encompasses R & D, fabrication of components, prototype production, static testing, launching, logistic support and field maintenance problems.

But a shadow has now cast itself over ABMA, ARGMA and AOMC. The shadow is NASA—the civilian-operated space agency.

It is going to take over a chunk of the Redstone Complex, including Dr. Werner von Braun, the highly rated scientist of the Redstone operation.

All the big, truly cosmic-probing missiles and rockets probably will go to NASA now. But while there is bound to be some resentment of this on the part of Army Ordnance, from the broad, impersonal view, the overall Redstone Complex remains the same—in fact, the new civilian-style NASA blood may even give the whole operation a new dimension.

No question about it, Huntsville, Rocket City, U. S. A., has come a long way. Nobody would say anything now if someone flew a kite, if a lady rode a bike, or if someone shot a cannon to the moon. ■

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The Rock Island Arsenal

ROCK ISLAND, you might say, is the poor man's Gibraltar.

It is a rather formidable blob of land, some 946 acres, in all, in the Mississippi River and, while its address is Rock Island, Ill., it is an offshore island to Iowa as well. The first bridge to span the Mississippi was built across this island in 1856, connecting the Illinois and Iowa shores.

Military men were early intrigued by the military possibilities of this staunch-looking piece of real estate in the Mississippi and talked the Sac and Fox Indians out of it back in 1804. Shortly thereafter, Fort Armstrong was created on the island to protect the white settlers in the area.

It has served some prime military purpose ever since. During the Civil War it was converted into an arsenal. It also became the prison barracks for 10,000 captured Confederates.

Today it has the trim, well-kept look of some financially well-upholstered college campus. The hedges are immaculate, the lawns are broad and sweeping.

But these appearances are rather deceiving. Actually, immersed in all this vegetation flowering, there is quite a beehive of the most intense sort of activity. It is, in fact, the Government's largest manufacturing arsenal.

During the Spanish-American War, the Rock Island arsenal fabricated most of the articles of equipment for the infantry, cavalry and artillery soldier, including the limber, caisson, battery wagon and 3.02 inch field gun and 7-inch Howitzers. During World War I, it became known for its output of gun carriages, recoil mechanisms and rifles.

In World War II, it was not only strongly counted on for more of the same but also produced machine guns and mounts, airplane gun mounts, even Navy mounts. During the Korean War it became renowned for the *bazooka* and the 4.2 inch mortar.

Today Rock Island still has its hands in things. It is now the principal development and engineering site for the ground-to-ground rocket launchers, as well as for carriages and recoil mechanisms for light and medium field artillery.

It also is very much interested in the production of arm racks, limbers, linking and delinking machines and target materiel. In addition to being an arsenal in its own right, Rock Island is also the site of the Ordnance Weapons Command, whose jurisdiction also includes the Springfield (Mass.) Armory and the Watertown (Mass.) Arsenal and whose interest also includes small arms, such as pistols, rifles and machine guns, as well as ammo clips, ammo magazines and electrical generating equipment for seacoast artillery.

While each of these arsenals procures things "on its own," the Command set-up itself also does some procuring. And the Command, as well as each arsenal, is also concerned with industrial mobilization in the event of war or an emergency, as well as the current needs of Ordnance materiel and equipment.

It no doubt sounds facetious to describe Rock Island as a "poor man's Gibraltar", but the fact of the matter is, in this present air age, Gibraltar not only is a very exposed piece of Mediterranean property but one easily by-passed by the streaks of jet craft overhead, while Rock Island not only is very much a part of the hinterlands but highly creative militarily in its own right. The fact of the matter is that Rock Island today out-Gibraltars Gibraltar. ■

You and Missile Command

By Harold Helfer/DATA

THE Ordnance Corps is responsible for the Army's missile program and these are the hard-core facts concerning same:

A special division has been created within Ordnance to handle missiles and this is known as the U. S. Army Ordnance Missile Command.

It, in turn, is divided into three sections: Army Ballistics Missile Agency, Army Rocket and Guided Missile Agency and the White Sands Nuclear Range.

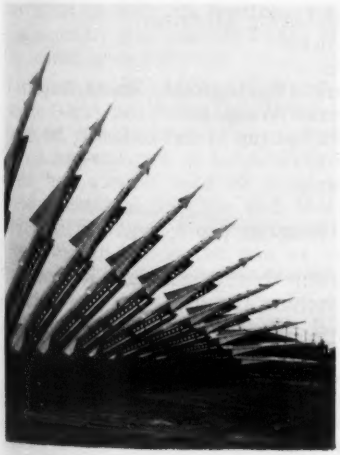
The agencies are located at Redstone Arsenal, Ala., the testing range is in New Mexico.

PRIME CONTRACTOR

R&D contracts for an entire missile system are usually awarded to one "prime contractor." He has the responsibility for initial production of all system components including the missile, launching and handling equipment, guidance, documentation and test equipment.

Invariably this means that much of this work has to be done by subcontractors. In many cases the dollar volume of business done by the subcontractors exceed that of the prime contractor.

The procurement of guided missile systems and the replenishment spares for them differ from the procurement of more stable goods. The requirement for the material is considered of such urgency that *normal competitive* procedures cannot be introduced until quite late in any program.



LARGE AND SMALL BUSINESS

It is clear that a company which aspires to become a key part of the Army's guided missile program must attain the capability and know-how of managing an entire missile system from its drawing-board design stage to the launching pad firing. The smaller companies would do well to concentrate on individual component parts of the system and establish a reputation in the field.

Because missiles are considered to be in their infancy and because of the rapid advance in electronics and rocket technology, missile systems never reach the state of design stabilization which is usual in more conventioal material. Many changes and modifications may be made as a missile is developed.

PROJECTS UNDERWAY

The Army is still producing the long-range JUPITER missile for the Air Force, but has been concentrating lately on the smaller types.

It is making progress in the development of REDEYE, a missile aimed at knocking out the low-flying strafing planes.

It is also hard at work on the PERSHING, which will be smaller but will have somewhat longer range than the 69-foot, 200-mile range REDSTONE it will replace.

Perhaps the most "glamorous" and certainly the most controversial missile it is developing at the moment is the NIKE-ZEUS, the anti-missile missile.

It will no doubt have to emerge as a highly sophisticated missile . . . for instance, one problem it must face is how to tell an enemy decoy missile from the genuine article.

REVIEW DRAWINGS

Before submitting formal proposals or bids, prospective contractors are given the opportunity to review whatever R&D drawings are available. (A security clearance may be necessary).

If you'd like to place your concern before the attention of the Army missile people, they'd be happy to receive information about your outfit and its capabilities. Submit your material to:

Commanding General
U.S. Army Ordnance Missile Command
Redstone Arsenal, Ala. ■

FEATURE ACTIVITY DATA

What Army Ordnance Buys And Where They Buy It

THE US ARMY Ordnance Corps maintains some 90 active installations and activities strategically located across the land, including such headline-making places as the missile-spawning Redstone Arsenal in Alabama and the missile and atomic testing White Sands range in New Mexico.

The Ordnance Corps is interested in "every needful service" pertaining to all weapons and ammunition—it is also concerned with combat and tactical vehicles; basic and developmental research; design, production and procurement; storage, issue and maintenance.

A diversified organization whose responsibility for weapons, under the single management concept of the Department of Defense, extends to practically all those used by the Marine Corps, a large number used by the Air Force and even some Navy items, it relies heavily upon private industry to accomplish its mission. About 90% of its money goes to industry and institutional research laboratories.

Here are the principal interests of the Ordnance Corps:

Ammunition
Artillery
Combat Vehicles
Fire Control Materiel
Free Rockets and Launchers (on vehicle)
Fuels and Lubricants
Guided Missiles (large and small)
Materials
Motor Transport
Qualitive Development Requirements Information
Small Arms
Special Weapons

These are the Corps' major locations and the main interests there:

Aberdeen Proving Ground (Aberdeen, Maryland)
- Ballistic Research
- Development of Protective Coatings
- Engineering Tests
- Human Engineering Evaluation.

Frankford Arsenal (Bridesburg Station, Pa.)
- Ammunition for Recoilless Rifles
- Ammunition up to and including 30 mm, except metallic belt links, cal. .30, .50, .60 and 30 mm
- Cartridge Actuated Devices
- Cartridge Cases
- Drill Ammunition for AA Guns and Recoilless Rifles
- Fire Control Equipment including Spotting Rifles
- MT Fuzes for Artillery Projectiles
- Projectiles
- Recoilless Rifles

Tank-Automotive Command (1501 Beard Street, Detroit)
- Combat and Transport Vehicles
- Gun Mounts for Automotive Vehicles
- Hydropneumatic Recoil Mechanism for Cannon Peculiar to Automotive Vehicle
- Supporting Research in Land Locomotion

Picatinny Arsenal (Dover, N. J.)
- Artillery and Mortar Ammunition
- Atomic Artillery and Demolition Type Munitions
- Mines
- Grenades
- Bombs and Pyrotechnics
- Demolition Charges
- Jatos (extruded and cast double-base propellants)
- Warheads (non-atomic, for guided missiles and rockets)
- Explosives

Redstone Arsenal (Huntsville, Alabama)
- Fuzes for Rockets and Guided Missiles
- Ground Equipment for Guided Missile Systems
- Guided Missile Systems
- Jatos (except propellants)
- Propellants for Guided Missiles
- Rockets (excluding warheads)
- Rocket Launchers

White Sands Missile Range (Las Cruces, New Mexico)
- Long Range Research on Rockets and Guided Missiles

Diamond Ordnance Fuze Laboratories (Connecticut Avenue and Van Ness St., Washington, D. C.)
- VT Fuzes and Electronic Devices

Watervliet Arsenal (Watervliet, New York)
- Cannon for Medium and Heavy Field Artillery, AA, Antitank and Combat Vehicles
- Mortars, with Carriages and Carts

Rock Island Arsenal (Rock Island, Illinois)
- Arm Racks
- Carriages for Towed Cannon
- Hand Carts
- Hydropneumatic Recoil Mechanisms
- Launchers (rocket, ground-to-ground)
- Limbers
- Linking and Delinking Machines
- Recoil Mechanisms
- Target Materiel

Springfield Armory (Springfield, Massachusetts)
- Automatic aircraft Weapons
- Belt Links and Clips (up to and including 30 mm)
- Chargers
- Feed Mechanisms
- Flash Hiders
- Ground Type Weapons (up to and including 30 mm)
- Machine Guns (up to and including 30 mm)
- Mounts for Machine Guns

Watertown Arsenal (Watertown, Massachusetts)
- Carriages for Towed and Heavy Field Guns
- Mounts for AA Guns
- Recoil Mechanisms for AA Guns
- Rocket Launchers (ground-to-air)

Profiles of Army Ordnance Key Executives

LIEUTENANT GENERAL J. H. HINRICHS
Chief of Army Ordnance

BULLETS AND GUNS, fuzes and bombs, rockets and launching pads are not the only things that go together in the Army. So do Hinrichses and Ordnance.

Lieut. Gen. John H. Hinrichs, the current Chief of Ordnance, was born at old Sandy Hook Proving Ground, N.J., and for a good reason. That's where his father, an Ordnance officer, was stationed at the time.

And Gen. Hinrichs now has a son, Lieut. Robert M. Hinrichs, who is stationed at the White Sands Proving Grounds, New Mex.—also an Ordnance officer.

Few men probably have had a better grounding in Ordnance matters than General Hinrichs. His dad taught him the lore of weaponry at an early age but the general acquired a good deal of it the hard way. He served in an artillery outfit to learn how to actually handle the major weapons and went to school to learn the academic and theoretical approach. He attended three schools in all, Pomona College in California, West Point and Massachusetts Institute of Technology, where he received a degree in mechanical engineering. Last, but by no means least, he went to Ordnance School at Aberdeen Proving Ground, where, incidentally, he served in both tank-automotive and bomb project posts. He learned the science of Ordnance comprehensively enough to participate in the designing of small arms ammunition plants.

General Hinrichs is a distinguished-looking officer who probably comes as close to looking like the average individual's conception of what a general should look like as anyone you can mention. His personality seems to blend in with his bearing. He talks straight from the shoulder and you don't have to worry about where he stands on any matter.

When he isn't taking a stand on some matter or other—and his stands can involve millions of dollars and the military posture of our nation—he likes to sit. With rod and reel in hand. He's an ardent fisherman and hies himself over to some of the nearby lakes and streams of Virginia and Maryland whenever the press of Pentagon business eases sufficiently. He also likes to get out on the golf as well as the ordnance ranges and swings a pretty fair niblick.

He's married to the former Miriam Marble of Pasadena (no kin to tennis champ Alice) and they have another son, John Jr., who is with a Los Angeles title insurance concern.

While he has quite an imaginative and exploratory mind on Ordnance matters, he sticks pretty much to steak at the dinner table, doesn't see any need to try to improve or imbellish on a well-cut properly-sizzled slice of beef. If needs be, he can handle that steak himself on the stove or over the charcoal pit and seldom flubs the job. His beverage taste tends to the conservative side too—scotch and soda.

His taste in literature though is a bit surprising. It runs somewhat to the whimsical and poignant side of things. He collects books by Robert Nathan and Paul Gallico.

MAJOR GENERAL AUGUST SCHOMBURG
Chief of Army Ordnance Command

MAJOR GENERAL August Schomburg, the new head of the U. S. Army Ordnance Command (he took over in February) is one fellow who appreciates very much the factor of time.

This is not only because he is thoroughly aware of the urgent nature of the nation's missile program but he has a sort of built-in awe about the workings of time. In fact, that's what he likes to do mostly in his spare time, take apart old clocks and get them in spruced-up tick-tock condition again.

The general steps into a job in which the sense of urgency is also mixed with an aura of some disgruntlement within his command. There are Army missile people who haven't taken too kindly to the fact that an upstart civilian agency, NASA, is stepping into the picture and taking over a substantial share of the space effort on the Redstone compound. While it hasn't been formalized yet, the noted rocket scientist Von Braun is slated to leave the Army Missile Command to work for NASA and this has caused bitterness too. Maj. Gen. J. B. Medaris, the man Schomburg succeeded at Redstone, let out a mighty blast at the "NASA takeover" as he stepped into retirement.

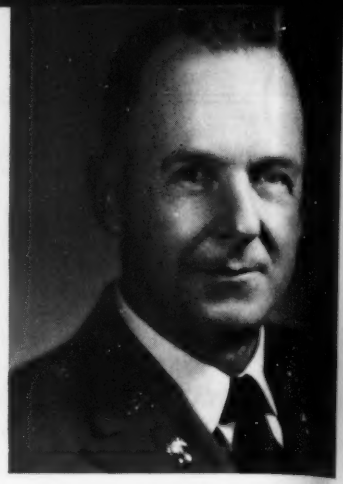
But Gen. Schomburg is realist enough to know that NASA is here to stay, that it will undoubtedly handle the major long-range space projects and that the Army is going to have to live with this in mind. He'll probably settle for manifestly concentrating on the obvious military-type missiles but keep close tabs on NASA for any starry-eyed developments that may have military significance.

Gen. Schomburg is only 52, is regarded as having a "receptive" and "adjustable" mind. He's a native of Denver, thought he might become a mining engineer and attended the Colorado School of Mines before entering West Point.

His natural mechanical bent has made him a natural for Ordnance work. He's not only a great guy for col-

HINRICHS

SCHOMBURG



CLARK

lecting clocks (the more the merrier for taking apart and putting together again) but weilds a mean saw and hammer and is quite a carpenter.

General Schomburg is a grandfather, five times over, as a matter of fact. Married to the former Fern Alice Wynne of New York, they have three children, two married daughters Alice Ruth and Augusta Ann, and a son, August Jr., who's a second lieutenant in the Army.

The general gets in a good share of his meditative thinking around the water. He likes to get "at ease" by swimming about or by sitting on the edge of some body of water with rod and reel in hand.

BRIGADIER GENERAL CHESTER W. CLARK
Chief of Research and Development

GENERAL CLARK is a coldminded guy with a warm personality.

He always has been especially interested in cyrogenics, the science of low-temperature effects, and he's probably one of the easiest-going, most affable generals in the Pentagon. "He's a doll," one secretary described him.

General Clark spent most of his adult life in education, research, teaching and directing research. A native of San Francisco, he attended the University of California, receiving degrees in chemistry and physics. He obtained his PH.D. degree in physics at the University of Leyden, in the Netherlands. He taught mathematics and chemistry at the University of California and San Francisco College and did research in cyrogenics at Johns Hopkins University. And he was consultant and physicist at the Naval Research Laboratory for awhile.

During World War II, he served at the Los Angeles Ordnance office, then became assistant director of Ballistic Research Laboratories at Aberdeen Proving Ground and Director of R & D at Picatinny Arsenal. He served as Deputy Ordnance Chief with the 8th Army in Korea before assuming his present post.

General and Mrs. Clark, who is a graduate of the University of California too, have two children, Adri and Anthony, neither of whom are going to the University of California, but, instead, Duke.

General Clark is a devotee of classical music and owns an elegant Hi-Fi set. He's something of a linguist too, being especially good at French.

His favorite expression though is not *parlez-vous?* but *anybody for tennis?* He's an excellent tennis player and is out on the courts whenever he can make it.

BRIGADIER GENERAL OREN E. HURLBUT
Head of the Ordnance Weapons Command

GENERAL HURLBUT is the rather curious combination of being a very GI general and a civilian-minded citizen too.

Everything about him is spit-and-polish. He states frankly that he likes being a military man but he's always up to his ears in public-spirited events in the communities about him, too. He's a Rotarian, for instance, and is generally working hand-in-glove with some Chamber of Commerce endeavor or other. He's not only involved in Rock Island community doings but also nearby Davenport and Moline.

The general is inclined to be outspoken about things and can cause hair to bristle but people generally wind up with an appreciation of his above-boardedness.

While stationed at the Rock Island arsenal area, as head of the General Ordnance Weapons Command, Springfield Armory and Watertown Arsenal also are under his jurisdiction, which makes him one of the key men in Ordnance.

Gen. Hurlbut is from Missouri; Brookfield, to be exact, and he's a tough-minded show-me fellow, but has the military drive and enthusiasm to put something across once he's been "shown" and is convinced.

The general has a varied Army career, from his attending both the infantry and tank schools at Fort Benning and serving also at Aberdeen, Washington and West Point, among other places. He participated in the World War II invasion of Luzon and after the war stayed on in the Philippines for several years. He has been awarded the Bronze Star and the Philippines Medal of Merit.

Married to the former Pauline Bartels of St. Louis, he has four children, Susan, Sally, Sandra and Stephen.

HURLBUT

BIGELOW

CARLSON

ranging in age from 12 to 4. He's an avid golfer and loves to fish too, when he can get away long enough. He seems to have just as much fun though when he's out ice-skating or bowling with his family. Next to being able to reel off the nomenclatures of gun components, he's also something of an expert at coming up with all sorts of hard-and-fast baseball facts. He's an out-and-out fan of the national pastime.

If he sometimes seems a little too keenly military-minded and weapons-preoccupied, it is understandable. He was at Pearl Harbor on Dec. 7, 1941, when the Japanese bombs began to fall.

MAJOR GENERAL HORACE F. BIGELOW

Deputy Chief of Ordnance

WHILE HIS NAME is listed on the official records as Horace F. Bigelow, his wife calls him Freeman. And, no doubt understandably, the general appears to prefer to be called by his middle rather than his first name.

General Bigelow has the reputation of being both very GI and very *Yankee*. He's held Army posts ranging all the way from Italy to Japan in his almost three decades with the military post, but you can still detect the Boston in him.

He has the Yankee bent for working hard and doing his chores well—and he expects others to do likewise. He's a keen student of both human nature and the physical sciences. He watches absorbedly through a pair of intellectual-looking specs whoever he may be conversing with, and he's a top-notch do-it-yourself man.

He seldom spends a penny on garage bills. Attends to most of the auto repair work himself. And he's a great guy for patching up furniture around the house. His wife doesn't even have to tell him.

The Bigelows have two daughters, Louise and Judith, both of whom are married to Army men. He stays pretty much away from beverages, is partial to fish dishes, particularly shad roe.

Like most New Englanders, General Bigelow is regarded as a bargainer who can more than hold his own and acquaintances say he is especially skillful in handicapping negotiations on the first tee of the Army-Navy Club where he can be found on Saturday mornings, the good Lord being willing and Pentagon pressure permitting.

BRIGADIER GENERAL GUNNAR C. CARLSON

Chief of Industrial Division

NO DOUBT ABOUT IT, the general has the perfect name for somebody in Ordnance.

But the Gunnar in his name is not so much a reflection of his avocation as it is of his Swedish ancestry. In fact, during his West Point days, that's what everyone called him, "Big Swede." Now, since he's made his mark in Ordnance, most of his associates call him "Gunny".

"Gunny" or "Big Swede", he's still partial to Swedish food. Once a year, on New Year's Day, he makes up a batch of "Swedish Glug," a drink made from an old Swedish recipe.

The general is a native of Moline, Ill., married a hometown girl, Mable Johnson. They have two sons, Gunnar Jr. and Ken. Gunnar is at West Point now, Ken goes to high school in Alexandria, Va., where the Carlsons are presently making their home.

The general is a do-it-yourself man from way back. Built his own recreation room.

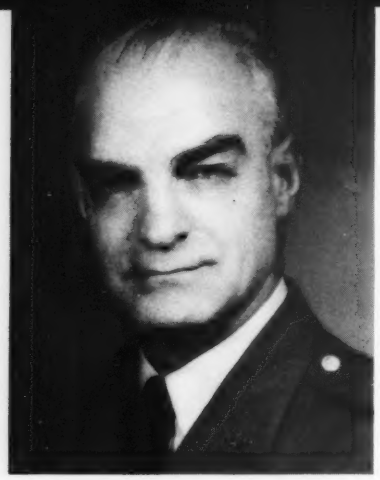
He likes to work in the garden too, sometimes getting in a few licks in the morning before going to the office. His athletics these days are pretty much confined to bowling, is by no means bad at it, getting into the upper 180's on occasions.

The general goes in for painting too, having one of those paint-by-number sets. This may be artistic endeavor on a somewhat more modest level than Rembrandt, but the Ordnance officer nevertheless gets a kick out of it.

General Carlson likes to read his newspapers fresh, but he settles for second-best when it comes to novels, waits until his wife has finished with a best-seller, then takes it over.

MAJOR GENERAL NELSON M. LYNDE, JR.

Chief of Field Service



LYNDE **CAVE**

THAT FELLOW YOU SEE up at the crack of dawn on the grounds of his Falls Church, Va., home would be Major General Nelson Lynde.

He just can't wait to get to work on that garden of his. Well, it really isn't that the general is such an out-and-out fanatic about things but, you see, he and Mrs. Lynde (the former Gertrude Lange of Oshkosh, Wis.) have traveled from pillar to Army post all their married life and this is the first home of their own. The general picked, bought and payed for it before his wife even saw it and she thinks he chose wisely. It's a one-story affair, with a nice workshop in the basement.

When the general isn't gardening or reading on the American Revolution or Civil War—or books about other generals—he's in the workshop, refinishing furniture or working on some new project, which at the moment is building a Hi-Fi cabinet.

General Lynde is probably the only Cadillac man extant who never drives same. He's turned it over to his wife, has become a small-car fellow himself, drives a Consul.

The general is a nice husband in other ways. He cooks the week-end breakfasts for his wife. He also usually attends to the outdoor grill cookeries. Before dinner he likes to relax with a light scotch and soda. He never watches TV.

The general and Mrs. Lynde have two children, First Lieut. Nelson M. Lynde III, USAF, and a married daughter, Mrs. Wade Leech, who has given them three grandchildren, the latest of very recent vintage.

A native of Kansas City, the general has alternately served with Army in Ordnance and armored units, winning the Legion of Merit and Bronze Star for his role with Seventh, First and Fifteenth U. S. Armies in Europe during World War II. He has the reputation in the Pentagon of getting "down to earth" on a problem. In checking out some Ordnance development, he'll invariably talk to privates out in the field to see what they think of it, how it is working out for them. He is also interested in their morale. His philosophy: "If you have a good morale in the individual, you have good morale in the outfit."

BRIGADIER GENERAL JOHN W. CAVE
Chief for Program Coordination

YOU MIGHT SAY that Brigadier-General Cave is no cave man.

He goes in for classical music, has so many of these records that his wife, Agnes, has long since lost count of just how many.

His taste in literature is out of the norm too. For instance, lately he's been reading Thurber's book on the *New Yorker*.

His literary-like leanings seem to have carried over to a son, Ray, who is one of the editors of *Sports Illustrated*. Another son, John, has more of a scientific flair, though, and is with Remington Rand Univac. It's too early to say in which direction third-son Christopher will go. He's just 12 and the whole world is his oyster at the moment.

General Cave was born in Los Angeles, attended U. S. Military Academy, served first in the Army as a second lieutenant in the horse-drawn 10th Field Artillery at Fort Lewis. He joined Ordnance some eight years later, served in areas ranging from Germany to the Philippines. His knowledge of German ordnance is probably second to none. He took a course in Columbia University in business administration.

The general is a bug on cutting red tape. In his office in large letters is the admonition: "SIMPLIFY". Much of the trouble in military matters, he is convinced, is an affliction known as verbosity. He was instrumental in Rudolf Flesch, renowned simplified writing expert, attempting to improve Ordnance staff officers' writing.

The general is a bug about something else: the outdoors. He couldn't wait to join the Boy Scouts, became one of the first Eagle Scouts in Montana, where he was living at the time. He liked outdoor living so that before going to West Point he lived a roustabout life for a couple of years, moving around the country in a variety of jobs: Copper miner, stock clerk, ranch hand, oil field worker. He really wanted to join the Navy and see the world, took the Annapolis entrance exam and passed it, but was turned down because of poor color perception.

The general's call of the wild is now confined pretty much to the golf links, where he shoots in the 80's. He is quite good at bowling too and is something of a camera addict also. Palate-wise, he's a rare N. Y. sirloin man, and likes Baked Alaska for dessert. ∎

DATAGRAM

AIR/SPACE DATA

GREEN LIGHT FOR SATURN

House Appropriations Committee has approved Fed Space Agency budget for all rocket and space shots. Salaries and buildings funds were sizably cut. ///UPI/

FAA PROPOSES INSTRUMENT RECORDING

To determine accident cause, the rule would require all turbine powered passenger aircraft to carry flight recorders. ///FAA/

ARMY TO DVLP LIGHTWEIGHT COPTER

Designed to replace 3 current 'copters, the observation aircraft will be turbine-powered and cruise at 126 mph. ///Army/

CONTRACT

U.S. Army has recently ordered 22 Caribou aircraft from Canada. The Caribou is the Army's largest fixed-wing aircraft, with a range of 200 miles when fully loaded. ///DATA/

CONTRACT

Gyrodyne from the Navy: $\$5\frac{1}{2}$ million for production of drone helicopters to be used in the anti-submarine warfare program.

COMMUNICATIONS/ELECTRONICS DATA

SINGLE ELECTRONICS PURCHASING FOR SERVICES

DOD recently announced that it is considering a proposal that one of the 3 services be assigned management of all purchasing of electronic replacement parts, thus cutting down paper work for Govt and Industry. ///EI/

RUBY RADIO BEST YET

This new electronic ear, called "Ruby Maser" can detect clear radio signals from far greater distances than formerly possible. By cooling the ruby heart of the receiver, atomic noises from within the gem are cut to a minimum. New dvlpmt useful in inter-space communications with satellites, rockets, and in radio astronomy. ///Army/

COAST-TO-COAST DATA PROCESSING

To speed up and increase efficiency of personell management, USMC has installed a data processing network linking East and West coast Hdqs with Washington. ///DATA/

AUTOMATION AT AMC

Wright-Patterson AFB has installed an IBM 705 to sort and process paper work. For contractors this means speedier attention and less complicated paper work. ///AF/

MOST COMPACT SUB-MODULE

Republic Aviation has dvlpd a dice-sized circuit unit. Each of these units has 12 to 18 components. Result: more logic capacity in a smaller space. ///Republic/

VACUUM FURNACE SIMPLIFIES TUBE PRODUCTION

Bureau of Standards has dvlpd a new furnace which will produce up to 200 electron tubes per hour. The new system permits a simplified design of tubes, as well as an easier method of production. ///DATA/

TRANSISTORIZED TV CAMERA BY G-E

New closed-circuit TV camera, smaller than a bread-box, weighs just 9 lbs. Made to withstand extreme vibration. ///G-E/

TAPCO TO MAKE SUNFLOWER I

The Thompson-Ramo-Wooldridge division will construct the solar auxilliary power system for spacecraft. It will weigh 700 lbs. to generate 3,000 watts of electrical power continually over a period of one year. ///NASA/

NEW RADAR MAKES CLEAR PIX

The new Army airborne radar can separate objects better than the human eye at great distances. Pix taken with this radar compare favorably with clear aerial photos. ///DOD/

COMFORTING THE GUINEA PIG

Rather than inserting transducers under the skin of first space travellers, scientists have dvlpd a method of tattooing them on human skin, still permitting adequate monitoring from ground stations. ///DATA/

THE INSIDE STORY

New system by Gulton Industries for ARDC, monitors and transmits 13 body activities of pilots in flight, permitting more complete medical observation. ///ARDC/

CONTRACTS

Navy to Westinghouse Electric; $38.5 million for design, dvlpmt, and construction of prototype long-range radar for TYPHON weapon system.

From FAA to Raytheon; $5,900,000 for 200 mi. range radars.

Burroughs for the Army; $13 million for classified communications equipment.

Raytheon for the Army; $12½ million for HAWK ground support equipment battery sets.

GROUND SUPPORT DATA

MISSILE MONITOR FOR FREE EUROPE

The first mobile air defense missile fire detection system in now being deployed to operational sites with the US Army in Europe. The unit can detect, track, and store info. on large numbers of airborne targets. ///DOD/

LAND NAVIGATION SYSTEM

For travel over unmapped areas, the US Army Engineers have dvlpd an 85 lb unit which can be mounted on any Army vehicle, giving position and distance to destination. ///DATA/

RADIATION EFFECTS TO BE STUDIED

New facility at Dugway Proving Ground, Utah, will provide nuclear radiation under controlled conditions to test effects on personell, weapons, shelters and other equipment. ///DOD/

CONTRACT

Army to Chrysler — $4,750,000 for JUPITER ground support equipment. ///Army/

LOGISTICS/MATERIALS DATA

CONCENTRATED FLAVOR

USDA scientists have isolated the aroma-bearing materials found in different meats. The new process may be used to flavor algae for consumption by space travellers. ///USDA/

LIGHTER BOOT KEEPS FEET WARMER

Army Quartermaster Corps has dvlpd a new white insulated boot for Arctic use. It is 2 lbs lighter than the presently used boot, and can be worn comfortably at -102 degrees (F). ///Army/

SPRAY GUN FOR TACKY MATERIALS

New product from Binks Manufacturing simplifies application of liquid plastic, resin and other tacky materials. ///Binks/

HOW TO SPEND MONEY?

The AF is spending $72 million for manuals on how to operate its machinery. $4 million of this was spent on a how-to book for the NIKE-HERCULES system. ///UPI/

MISSILE DATA

CENTRALIZED CONTROL

Sec of Defense recently announced that control and coordination of test ranges, tracking stations and other technical facilities will be centralized under the Office of the Director of Defense Research and Engineering. ///DOD/

NATO FORCES FIRE NIKE

As part of a training program, each NATO country will fire one NIKE-AJAX and one NIKE-HERCULES missile against a target drone at Fort Bliss, Texas. ///DOD/

HOUND DOG TESTED ON LONG-RANGE FLIGHT

A B-52 carried the HOUND DOG 10,800 miles over the pole and back to Cape Canaveral where the missile was fired, proving the feasability of long-range attack missions. ///DOD/

CONTRACTS

Army to Western Contracting — $17\frac{1}{2}$ million for ATLAS launching sites.

Navy to G-E — $4,895,000 for more SIDEWINDER air-to-air guided missiles.

Army to Chrysler — $1,120,000 for JUPITER missile system.

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Washington 6, D. C.
HUdson 3-9450

ARMY BALLISTIC MI

REDSTONE ARSENA

DATAGRAF CHART-OF-THE-MONTH

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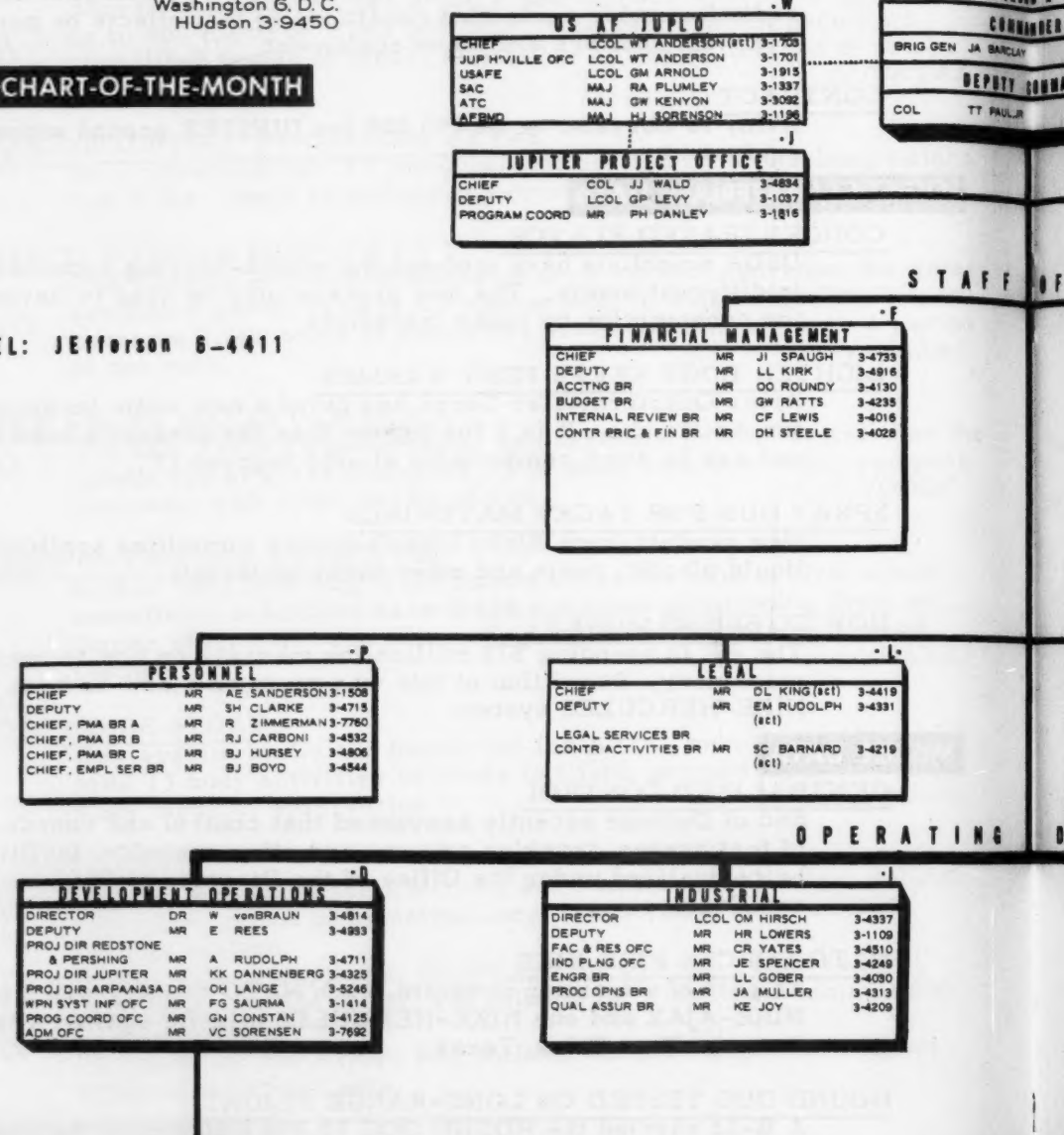
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US AF JUPLO
CHIEF LCOL WT ANDERSON (act) 3-1708
JUP H'VILLE OFC LCOL WT ANDERSON 3-1701
USAFE LCOL GM ARNOLD 3-1915
SAC MAJ RA PLUMLEY 3-1337
ATC MAJ GW KENYON 3-3092
AFBMD MAJ HJ SORENSEN 3-1196
.J
JUPITER PROJECT OFFICE
CHIEF COL JJ WALD 3-4834
DEPUTY LCOL GP LEVY 3-1037
PROGRAM COORD MR PH DANLEY 3-1816
BRIG GEN JA BARCLAY
DEPUTY
COL TT PAUL JR
STAFF
.F
FINANCIAL MANAGEMENT
CHIEF MR JI SPAUGH 3-4733
DEPUTY MR LL KIRK 3-4916
ACCTNG BR MR OO ROUNDY 3-4130
BUDGET BR MR GW RATTS 3-4235
INTERNAL REVIEW BR MR CF LEWIS 3-4016
CONTR PRIC & FIN BR MR DH STEELE 3-4028
.P
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DEPUTY MR SH CLARKE 3-4715
CHIEF, PMA BR A MR R ZIMMERMAN 3-7760
CHIEF, PMA BR B MR RJ CARBONI 3-4532
CHIEF, PMA BR C MR BJ HURSEY 3-4806
CHIEF, EMPL SER BR MR BJ BOYD 3-4544
.L
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CHIEF MR DL KING (act) 3-4419
DEPUTY MR EM RUDOLPH (act) 3-4331
LEGAL SERVICES BR
CONTR ACTIVITIES BR MR SC BARNARD (act) 3-4219
OPERATING
.D
DEVELOPMENT OPERATIONS
DIRECTOR DR W vonBRAUN 3-4814
DEPUTY MR E REES 3-4933
PROJ DIR REDSTONE & PERSHING MR A RUDOLPH 3-4711
PROJ DIR JUPITER MR KK DANNENBERG 3-4325
PROJ DIR ARPA/NASA DR OH LANGE 3-5246
WPN SYST INF OFC MR FG SAURMA 3-1414
PROG COORD OFC MR GN CONSTAN 3-4125
ADM OFC MR VC SORENSEN 3-7692
.I
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FAC & RES OFC MR CR YATES 3-4510
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IC MISSILE AGENCY

ARSENAL ALABAMA

1 MAY 1960

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ORDD-X

COMMANDER

ARCLAY	3-2122

TY COMMANDER

AUL,JR	3-2124

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EXECUTIVE OFFICER

EXECUTIVE OFFICER	LCOL	NI	REITER,JR	3-2126
EXECUTIVE ASSISTANT	MR	HK	KATZ	3-4416
CHIEF, PROTOCOL	MR	E	RIDDICK	3-1161

F OFFICES

·C

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PROGRAMS BRANCH	MR	TU	HARDEMAN	3-3308
REVIEW BRANCH	MR	JH	DRAUGHON	3-1323
R & D LIAISON BR	LCOL	E	LESOWITZ	3-1528
LIAISON OFC BMD	MAJ	JC	FISCHER	
LOS ANGELES, CAL.	ORchard 0-1444		Ext.	2552
ABMA PROJ OFC	MAJ	RE	BASSLER	
AMRAFO, PAFB, FLA.			UL	7-6242

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PLANS & PROG BR	MR	JP	WALLER	3-2811
FACILITIES BR				
CONSTR & MAINT BR	MR	RP	LOPEZ	3-4917

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ADJUTANT BRANCH	CWO	S	BOURLAND	3-4234
TECH MATL & EQ BR	MAJ	CA	BOTERF	3-4732
TECH DOC LIB BR	MRS	CF	CHESNUT	3-1027

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TNG PLANS & RQR BR	CAPT	EE	MARVEL	3-4820
INDIVIDUAL TNG BR	MR	HE	KING (act)	3-4135
UNIT TNG BR	MAJ	LH	TOWNSEND	3-5297

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MSL SYST EVAL OFC	MAJ	HA	LAWSON	3-4519
JUPITER SPT MGT OFC	MR	JA	REGA	3-4553
SUPPLY MGT BR	MR	H	BAUM	3-4101
CATALOGING & PUB BR	MR	HC	STRANG	3-3097
MAINTENANCE BR	MR	HE	MARCUS	3-1106

A TORIES

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TON & ASSEMBLY ENGR.

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MR	WR KUERS	3-1402
MR	SF HEIM	3-2002
MR	DT WALTERS	3-4538

·DG

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DEPUTY	DR	F	MUELLER	3-3815
TECH PRG COORD	MR	GF	DAUSSMAN	3-5437
ADM ASST	MR	ML	JENSEN	3-2834

·DY

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TECH PRG COORD	MR	JR	BRUCE	3-1743
ADM ASST	MR	JR	BRUCE	3-1743

·DR

ANL. & RELIABILITY

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MR	D GRAU		3-4124
COORD MR	RR BECKS		3-2422
MRS	G PETTUS		3-1614

·DT

TEST

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TECH PRG COORD	MR	TE	EDWARDS	3-2880
ADM ASST	MR	WH	DODD	3-1312

·DL

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TECH PRG COORD	MR	RL	BODY	3-6306
ADM ASST	MR	BP	CARTWRIGHT	3-3819

ANECDATA

More Manual Mania

From a recently-published Navy pamphlet:

"One of the advantages of being a Navy-type flyer is that you often have an opportunity of aviating over large expanses of deep blue sea where there are no water towers, tall buildings, or clouds stuffed with rocks to bump into. There aren't many check points either, but then you can't have everything. Another little drawback, as the survival experts point out, is that if your airplane has to come down for reasons of its own and in opposition to your wishes, you are pretty certain to get wet."

* * *

Definition making the rounds:

Executive: A man who goes from his air-conditioned office in an air-conditioned car, to his air-conditioned club, to take a steam bath.

* * *

His own judge

When Neil H. McElroy was Secretary of Defense, he was called on the carpet by Congress to explain why he'd held up military manpower cuts during the Lebanon crisis but allowed the manpower cuts to be carried out during the tense Berlin crisis.

This was McElroy's answer:

"Any rationalization I could give you isn't one I regard with any great respect myself."

* * *

Army ready for celestial encampments

The Army came up with some new verbiage to meet the space age challenge.

Assuring the House Space Committee that the Army will have a role in future space operations, Gen. Lyman L. Lemnitzer said this will be particularly true "at such time as we may be able to effect human lodgements on habitable celestial bodies."

Apparently he meant that the ground forces will play a bigger part once barracks are built on other planets.

* * *

FUBB

President Eisenhower is given credit for coining this new term describing chaos at the Pentagon.

It's FUBB—"Fouled Up Beyond Belief."

* * *

New ideas, anyone?

Defense Secretary Thomas S. Gates Jr. is a fellow who doesn't like toadying.

When a new aide took to buttering him up a little too much, Gates told him: "Look, I need ideas. I can light my own cigarettes."

* * *

Sign at Navy Headquarters:

"It's Not So Bad If Your Mind Goes Blank—If You Always Remember To Turn Off The Sound"

* * *

Not typically German

Kraft Ehricke, Convair space scientist, states that he is a non-statistical German. He explains: "I don't care for either beer or sauerkraut."

These evaluations of individuals in the military service are actually culled from official commanding officer fitness reports:

"His leadership is outstanding except for his lack of ability get along with his subordinates."

"He never makes the same mistakes twice but it seems to me has made them all once."

"A quiet, reticent officer. Industrious, tenacious, careful and neat. I do not wish to have this officer as a member of my command at any time."

"In any change in policy or procedure, he can be relied upon to produce the improbable, hypothetical situation in which the new policy cannot work."

"He needs careful watching, since he borders on the brilliant."

"He is open to suggestion but never follows same."

"He is keenly analytical and his highly developed mentality could best be utilized in the research and development field. He lacks common sense."

"This man has talents but has kept them well hidden. He can express a sentence in two paragraphs at any time."

* * *

Manual Mania

Anybody care to dispute this?

The Navy pamphlet Executive Future: Officer Candidate School In The Navy *carries this line:*

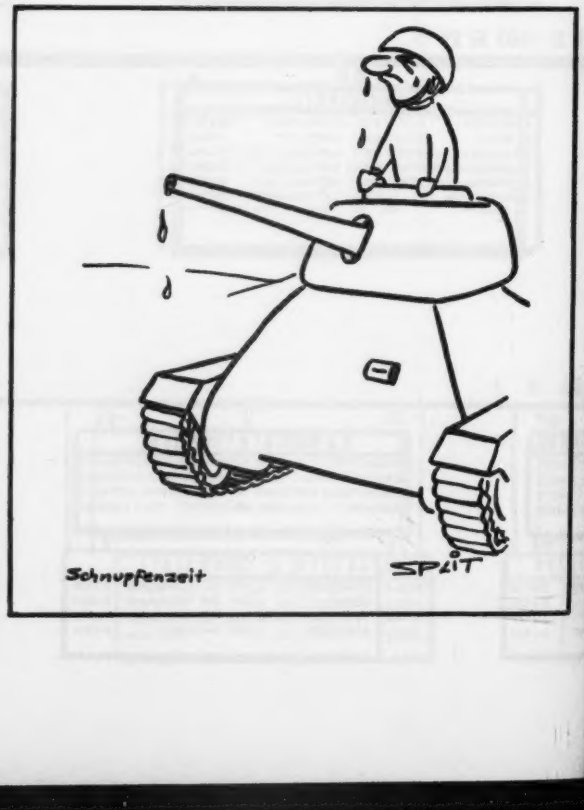
"Aircraft carriers are slower than planes, but, of course, faster than fixed land installations."

* * *

Flushing out scientific discoveries

A bathroom at a temporary structure Government building in Washington has been converted into an Air Force Office of Scientific Research.

* * *



Evaporating the problem

When snow plows finished clearing the runways after a storm, large puddles of water remained on the concrete at the Andrews Air Force Base (near Washington, D. C.). Sub-freezing temperatures were forecast for the night and ice-slicks, hazardous to landings and take-offs, were certain to form. Past experience had failed to supply any remedy—under such conditions flying operations were generally restricted.

But suddenly Lieut. Col. George Mosconi, the Operations Officer, got an idea. He called the 1001st Helicopter Command and got three helicopters to hover over the runways and dry them off with the downdraft of their rotor blades.

It worked.

* * *

Pits from the cherry orchard

In a satirical skit at the annual get-together of the Gridiron Club, the following conversation is supposed to have taken place between Allen Dulles, director of the Central Intelligence Agency, and Secretary of Defense Thomas S. Gates:

Gates: "How many missiles have the Russians got?"

Dulles: "I won't know until the Treasury tells us how many we can afford to have them have."

Gates: "What's the latest from your agents in Russia?"

Dulles: "I dunno. Our copy of Pravda is late today and somebody stole our scissors."

* * *

Scientific license

Why did PIONEER V, our latest entry in the cosmic derby, turn out to weigh 94.8 pounds instead of the previously advertised 90 pounds?

A spokesman for the National Aeronautics and Space Administration gave this explanation: "Scientists don't work on the basis of our press releases."

* * *

No surplus in brains

Senator Stephen Young (D., Ohio) tells of a congressional hearing on the billion plus bushels of wheat in storage. "Just what is it we don't already have in surplus quantity?" One of the Congressmen demanded.

The committee chairman answered, "Brains, I think."

* * *

Carry over in peaches

When he argues that eliminating production controls and rigid price supports would give farmers more freedom and reduce crop surpluses, Agriculture Secretary Ezra T. Benson likes to reminisce about his childhood.

He explains that he was raised in a family of 11 children and, as the brood grew, his mother had to bottle more peaches each year. The number of bottles ranged from 300 to 1000.

"It was a flexible program," says Mr. Benson. "My mother made the adjustment on the quantity of peaches available. She made the adjustments as farmers do when they are free. She was free. There was a slight carryover from year to year, but no surplus."

* * *

Age of specialized selling

How's this for super public relations? Trans World Airlines has special pencils it gives to its left-handed patrons. The letters "TWA" on each pencil are printed so that a left-handed person can read them while he is writing with the pencil.

* * *

He's a son-of-a-gun

It seems an American visitor down in the Bahamas was jarred out of bed when a cannon went off. He stuck his head out of the window and hollered at a passer-by: "What is it? War?"

"Goodness, no," was the answer. "Elizabeth's had a baby."

As the visitor, who was an American and not paticularly mindful of the British royal family, got back into bed he remarked to his wife: "You can relax, honey. Somebody had a baby and I guess they're looking for whoever's responsible."

* * *

I must have missed that last directive

Upon receiving his promotion, a Health, Education and Welfare official sent a letter to Senator W. L. Prouty. But he'd overlooked one thing when he signed it. The electric typewriter had missed punching all the "e's" so the letter the senator got went along like this: "Sinc Congrss rcssd last Sptmbr thr hav bn ky prsonnl changs within th Dpartmnt of Halth ducation and Wlfar."

In his answering letter, the lawmaker put this signature to it: "Winston L. Prouty, Untd Stats Snator."

* * *

Sign in a research laboratory:

"IF IT WORKS, IT'S OBSOLETE"

* * *

Nixon not too handy around the house

When his wife revealed that he was no handyman around the house and couldn't "even manage a Venetion blind so that it pulls up level," Vice President Richard M. Nixon acknowledged he had "no mechanical aptitude—and besides I can't fix things."

* * *

Life on the moon impossible

Lady on phone in a room full of chaos, children and toys: "Yes, my view is that life on the moon is probably impossible—just as it is here."

* * *

Definitions in an FBI publication:

Spring *. . . the mating season for everything except the golf socks you put away last fall.*

Trouble *. . . something that always starts out like fun.*

Black Eye *. . . results of a guided muscle.*

Extravaganza *. . . someone a man usually finds out he married.*

Opportunity *. . . that which looks bigger going than coming.*

* * *

Problems of the future

A young detective in the Bureau of Missing Persons sat at his desk growing more and more thoughtful—practically brooding, in fact.

Finally, he turned to another detective in the bureau and said: "You know, I certainly dread the day when it actually will be possible to travel to other planets."

■

ARMY ROCKET & GUIDED MISSILE AGENCY

REDSTONE ARSENAL, ALABAMA

1 MAY 1960

C 24

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DEPUTY
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-IA BLDG 5681 EXT 3-2018

FACILITIES & RESOURCES OFFICE
MR. J. F. NEELY
-IF BLDG 5681 EXT 3-3714

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-IE BLDG 4500 EXT 3-2086

QUALITY ASSURANCE BRANCH
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-IQ BLDG 4500 EXT 3-1133

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-IX BLDG 5681 EXT 3-2331

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-FE BLDG 5664 EXT 3-3796

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-FC BLDG 5670 EXT 3-4896

SUPPLY MANAGEMENT BR.
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-FS BLDG 5670 EXT 3-3894

MAINTENANCE BRANCH
LT. COL. E.S. DETCHEMENDY
-FM BLDG 5681 EXT 3-5315

REDSTONE DIVISION OF ROHM & HAAS CO.
MR. ALLEN R. DESCHERE
BLDG 7540 EXT 3-2131

ORDNANCE MISSILE LABORATORIES DIVISION
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LT. COL. N.M. BENSTROM EXT 3-1606
TECHNICAL DIRECTOR
DR. R. C. SWANN EXT 3-2638
ASST. TECH DIRECTOR FOR DEVELOPMENT
MR. J. E. NORMAN EXT 3-5506
ASST. TECH DIRECTOR FOR CHEMICAL RESEARCH
DR. H. J. HALL EXT 3-1740
EXECUTIVE ASSISTANT
MR. L. R. SEGGEL EXT 3-1606
ORDXR-O BLDG 7120

REDSTONE DIVISION OF THIOKOL CORP.
MR. JOSEPH W. WINNINS
BLDG 7280 EXT 3-511

CONTROL OFC.
MR. J. F. RUSH
-OC BLDG 7120 EXT 3-2024

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MR. F. W. JAMES
-OP BLDG 7120 EXT 3-3732

RESEARCH LABORATORY
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-OR BLDG 4746 EXT 3-2960

OPERATING SERVICES OFFICE
MR. H. F. McMILLAN
-OO BLDG 7120 EXT 3-2432

MISSILE ELECTRONICS LABORATORY
MR. W. E. YOAKUM
-OM BLDG 5489 EXT 3-4049

SYSTEMS ANALYSIS LAB.
MR. C. J. KOEPER
-OR BLDG 7120 EXT 3-2986

Major-General John H. Hinrichs, Head of Ordnance Corps Answers DATA Questions

Q. What are one or two chief scientific breakthroughs Ordnance would most like to see happen?

(a) Nuclear shielding with a significantly improved effectiveness per pound.
(b) Single wave length infra-red devices.
(c) Pure fusion reactors and weapons.

Q. What do you consider the most promising Army missiles now being developed?

I consider all the missiles under development to be promising. There are two which will give us new capabilities. The REDEYE gives the individual soldier a better antiaircraft capability than ever before, and of course the NIKE ZEUS, when operational, will give us the capability of defending CONUS against intercontinental and intermediate range ballistic missiles. The SSM PERSHING will provide the Army with a longer range weapon than is now available; SERGEANT will provide greater reliability and improved performance over CORPORAL. Promising techniques to provide better divisional support missiles are being investigated vigorously.

Q. Do you think this country is giving too much emphasis to the missile end of things and neglecting other important military phases and areas? What areas do you think ought to be given more attention?

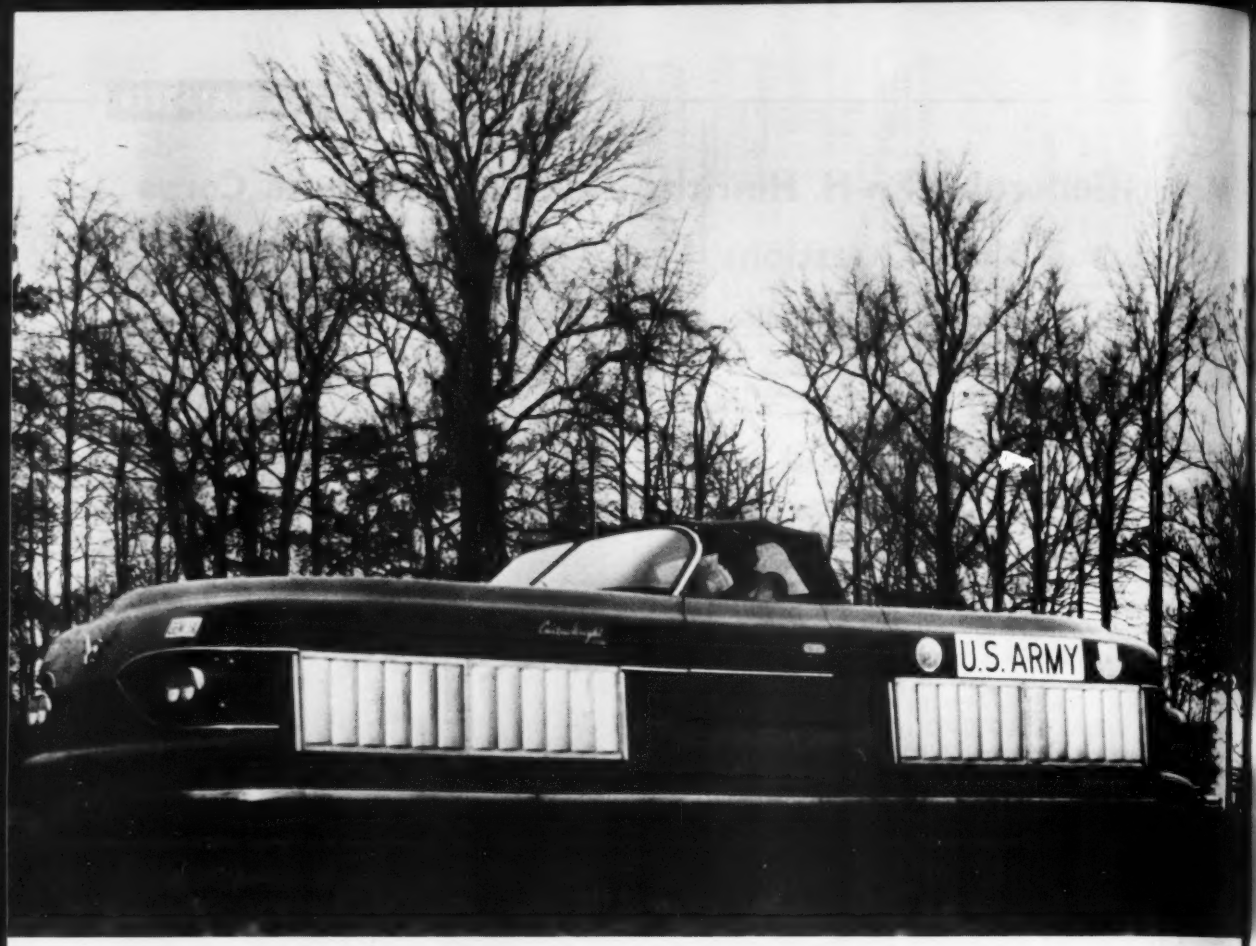
I do not think this country is giving too much emphasis to missiles. There are two major areas that I feel require additional effort, and they are those of target acquisition and land mobility.

Q. Do you think missiles will ever completely take the place of manned planes?

Missiles will never completely take the place of manned aircraft. This is certainly true in the field of transport aircraft. However, I do think they will eventually take the place of aircraft for a major portion of the strategic bombing missions one can envision. The degree to which short range missiles can replace close tactical air support is not yet clear. However, with the increased effectiveness of air defense weapons and improvements being made in short range missiles the trend favors the missile in this role.

Q. Is there some area in which American business and industry could somehow be of better help and assistance to the Army and Ordnance?

About two years ago Army Ordnance established the Qualitative Development Requirements Information Program designed to acquaint American business and industry with Ordnance problems. Based on information acquired in this program, many businesses have redirected their research emphasis to better help the Army. In the event your organization is not presently engaged under an Ordnance R&D contract, or if your organization desires to expand its sphere of interest into areas not covered by present contracts, you should direct your query to the nearest Ordnance District. The Ordnance District will then tell you how to go about becoming a qualified organization, and they will place you in touch with the proper Commodity Commands or Commodity Arsenals. During its first two years, and probably for some time to come, the QDRI program has been and will be based on current Ordnance problems. However, as we identify longer range problems, we will certainly call upon American industry to help in solving them. ■



LOOK, MA, NO WHEELS!

AT FIRST GLANCE, this might seem like a rather ordinary picture.

But, if you'll note closely, this car has no wheels.

And, not only that, it doesn't seem to be touching the ground!

No, this isn't trick photography. This is a literal fact. This car isn't touching the ground.

What is more, it isn't standing still either. It is moving along. In fact, the Army says it can do up to 35 miles an hour.

MANY USES

This may not seem like a lot of speed to some folks, but the Army figures it has something with this kind of car. It doesn't have to worry about bumpy, muddy, rutty roads. As a matter of fact, it doesn't need any roads at all.

The car can sail . . . literally . . . over any field, plateau, mesa, you name it.

The truth of the matter is, it doesn't even need any ground underneath. It can zoom along above any body of water just as well.

This "air car" moves on a 6 to 12 inch cushion of air blown from the car into the area between the base of the car and the surface over which it is moving.

HEAVY DUTY

These cars can carry a "payload" of 1000 pounds of cargo or four passengers or any combination thereof. Twenty-one feet long, 8 feet wide and 5 feet high, they resemble conventional automobiles in almost every respect . . . except for the rather startling fact that they don't have any wheels.

The air that provides the off-the-ground cushion for the car comes from a fan system driven by a pair of 180 horsepower aircraft engines. It is used not only for lift, but propulsion and to change direction. Driver controls include a conventional steering wheel and throttle. Since the driver does not have to balance the vehicle an the air cushion, these are used only for directional guidance and braking.

PROGRESS IN AIR CARS

The Army has been interested in "off-the-ground" cars for quite some time, and it looks like their practicality is close at hand. There's no reason that the speed can't be improved, too, as progress and refinements on this vehicle continue.

As a matter of fact, the Army is so encouraged by the way the air car has been making out during tests and experiments that it is going to take it to the Arctic this summer to see how it behaves there.

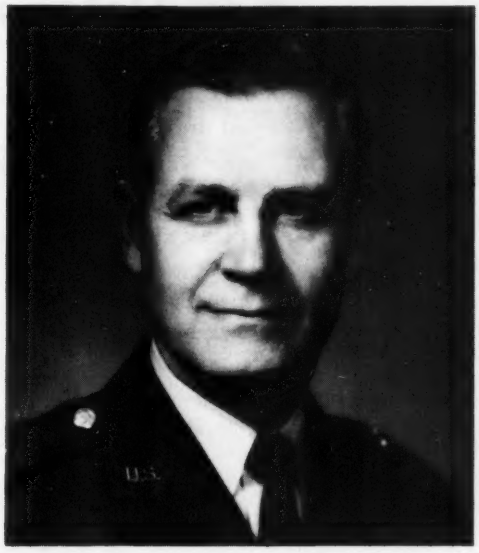
If it does all right over all that ice and snow, this could be the hottest automotive news in decades!

(One thing is for sure with this car—you'll never have to worry about punctures.) ■

Gen. Betts of ARPA* Comments on Our Defense Posture

An interview by Harold Helfer/DATA

**Department of Defense's Advanced Research Projects Agency*



ON THE MATTER OF ICBMs—

"The decision to cut the ATLAS design to 360,000 pounds thrust was a wise one. The ATLAS will carry a large yield nuclear warhead to ranges fully adequate to reach all major targets of interest. Moreover, I am virtually certain that the ATLAS is significantly more acurate than its Soviet competitor. The measure of target killing effectiveness is not only accuracy of yield, but the combination. Of the two, accuracy is the more important. . . .

"The Soviets have ended up with a missile about twice as large as our ATLAS but whether this gives them a better missile can be argued. The optimum size for any military weapon system is to have it just large enough and no larger. Size is related to cost, in this case also to amounts of fuel and liquid oxygen which must be kept always on hand, to the size of the launcher, the hole in the ground to protect the missile, and to various logistic support problems. As between the Soviet ICBM and our ATLAS, I vote for the ATLAS. . . .

"Our second generation ICBM will be even smaller than the ATLAS. The sold propellant MINUTEMAN should prove to be a significantly improved weapon system. . . ."

ON THE MATTER OF SPACE—

"The painfully embarrassing fact is that we have yet to make effective use of our ICBM in a space role whereas the Soviets made such a use as early as 1957. Our maximum effectively used thrust is still that of the IRBM, 150,000 pounds versus their 600,000 pounds. This need not have been so technologically. The situation would be different if we had actually accepted the impact of the use of space in 1954 when the Soviets began to address top level attention to it. . . .

"I am personally convinced that had the IGY VANGUARD satellite effort been accurately priced at the outset, even it would never have happened at all. People at that time were just not interested in the use of space. There was a hard time in getting the VANGUARD started with only a $20 million price tag. If priced at its ultimate cost of more than $110 million, VANGUARD would have died in concept. And the dollar support for VANGUARD was not a completely additive thing . . . it had to come out of the hide of DOD programs. I am absolutely certain that we in the military would never have agreed at that time to a $100 million bite out of our programs. . . .

AS MATTERS STAND NOW—

"In spite of the fact that the Soviet booster is about twice the size of the ATLAS in initial thrust, we have the hardware capability today to just about duplicate what they could do two years ago. This has been accomplished by optimizing the booster and upper stage combinations. . . .

"In another year or two, with the still further improved upper stage CENTAUR, we should actually be able to exceed anything the Soviets have done to date. *But what they will have been doing in the meantime is anyone's guess.* . . .

"We are apparently putting much more effort into the overall space program today than they are. The truly massive effort going into the SATURN program may well get us into the lead in the race for large thrust—*but don't bet on it.* . . .

Our greater hope lies in a growing evidence that *we seem to be more intelligent about the use of space.* While the Soviets seem to be going for splashy "firsts" related to their obvious advantage in large thrust levels, our program is more rational in terms of continuing payoff. Certainly a reconnaissance satellite, SAMOS, promises a great return, and the navigation satellite, TRANSIT, will have both commercial and military implications, as well as the weather satellite, TIROS. The very early warning satellite, MIDAS, promises to greatly increase the number of SAC aircraft that could get airborne in an all-out attack. These programs are being actively pursued. . . .

"As far as military weapons systems go, I am convinced we are fully abreast of the Soviets technologically. For exploitation of space, we lack the large thrust that gives them such a tremendous advantage. . . .

"Someday a man will step out of a space craft on the surface of the moon. Whether he is Russian or an American will have little direct military significance. But the prestige and other indirect effects are certainly important to our national security. *Let's hope he is an American.* . . ." ■

Biographical Sketches of Key Defense Leaders

WILBER M. BRUCKER
Secretary of the Army

NO ONE COULD accuse Wilber Brucker's dad of being the payola-type Congressman. When Rep. Brucker of Michigan died, his family was so unwealthy that Wilber, at 9, went out and sold newspapers to help carry his share of the family's economic burden. He also weeded sugar beets and did other such things to help make his way through school.

He got beat by a girl in a high school debate and that peeved him so he resolved to become an "orator." And he went on not only to become a member of the University of Michigan debating team but to hold the highest legal office in the State, the Attorney-General of Michigan. He became its Governor too.

Before such eminence though, he enlisted in the Army to join Gen. Pershing's expedition into Mexico to slap down Pancho Villa. He served in World War II, got into the toughest action with the Rainbow Division, rose from corporal to lieutenant and won the Silver Star for battlefield heroics.

He went back to his hometown, Saginaw, to start practicing law and marry his hometown girl, Clara Hantel, and then began his steady rise to prominence.

After his governorship, he tried to emulate his dad and get into Congress but failed in his bid as the Republican candidate for the Senate, but wound up in the national spotlight anyway when a fellow Michiganite, Charles E. Wilson, serving as head of Department of Defense, yanked him in as General Counsel for Defense. Brucker came to Washington with a reputation for being pro-McCarthy but showed his mettle when he crossed swords with McCarthy at the height of the Wisconsin Senator's power over matters of principle.

A former president of National Rainbow Division veterans, Brucker also belongs to the American Legion and VFW, is also a Mason, Elk and member of Delta Sigma Rho and Sigma Delta Kappa.

He is a rather unsvelte 5 feet 10, 182 pounder but it doesn't seem to perturb him unduly and is probably as active a Secretary of the Army as we've had, popping up all over the globe, sometimes with considerable splash, as when he recently issued some high-wide-and-handsome statements in the Far East regarding our military position there that rocked Washington quite a bit.

Speaking of splash, he has a private swimming pool at his home in the fashionable Grosse Point suburb of Detroit which he dearly loves to get into and does so when he can work out the opportunity. He is an extremely personable fellow and inclined to have a scholarly, sometimes ultra conservative approach to matters.

The head of the U. S. Army, he never forgets he was once an enlisted man and his favorite saying (one he made up himself) is, "There's often a general's brain in private shoes."

But what probably makes William Brucker even more unique than his having risen from private to No. 1 administrator of the Army is something that happened when he was Governor of Michigan, during the depression. He voluntarily, of his own free will, while of sane mind, cut his salary 10%!

GENERAL LYMAN L. LEMNITZER
Chief of Staff, Army

LYMAN LEMNITZER proved that life not only can begin at 40 but 50 too—as a matter of fact, 51. That's how old he was when he qualified as an Army parachutist.

He proved his point all right because he was later given the command of an infantry division in Korea.

Suavely handsome, Lemnitzer could have undoubtedly become a topnotch diplomat-type international troubleshooter, trenchcoat and all, the sort of polished and debonair but unswerving character that Charles Boyer used to play so well.

He participated in a derring-do secret submarine mission in North Africa during World War II and also played an important part in the behind-the-scenes negotiations for the Italian capitulation to the Allies. More recently, while head of American forces in the Far East, he sat on top of Sigmund Rhee, the President of Korea, when he threatened to get out of hand.

But the intelligent, sensitive-looking Lemnitzer has a keen military as well as diplomatic kind of mind. He headed the U. S. military mission that got together with the European counterparts to form NATO.

Lyman Lemnitzer is a small-town boy who made good. He comes from Honesdale, Pa. He's married to Katherine Mead Tryon and they have two children, Lois Katherine and William Lyman, who is in the Army too—a lieutenant. The Lemnitzers are Lutherans.

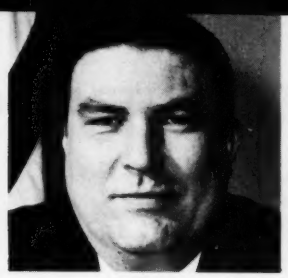
Lemnitzer is the quiet, penetrating type who seems to read your thoughts as he listens to your words. He has a scholarly bent, spends a good deal of his time at home reading, usually something with a military background or flavor.

He was convinced even in the darkest days of World War II that there'd always be an England, is now convinced, and dedicated to the proposition that there'll always be an infantry, that no matter how missile-prone and gadget-complicated warfare may become, the foot soldier will always be necessary.

He's an ardent fisherman and the feat for which he is probably as proud as any of his accomplishments is the time he caught a 27-inch rainbow trout at the Yugawa stream in Japan, the largest such fish ever caught there.

BRUCKER

LEMNITZER



YORK

BURKE

DR. HERBERT F. YORK

Director of Defense Research and Engineering

TRULY one of the bright young men of the Pentagon. Not yet 40, has what some consider the most important job in Defense next to Secretary Gates.

Regarded as perhaps the Pentagon's top idea-evaluation man. His judgment very often tips scale on contemplated research endeavors.

Born in Rochester, N. Y. Son of a Railway Express messenger. Showed marked science bent early. Helped work way through University of Rochester as mathematics computer. Can dangle a Phi Beta Kappa key if he wants.

Worked at AEC's Oak Ridge for awhile, particularly on electromagnetic isotope separation project. Became connected with the University of California, specializing in radiation laboratory work. Is technically on leave now from U. of C.

Known around the Pentagon corridors for his "bounce." Has a boyish exhuberance that seems to come straight from the campus. Regarded as able administrator though, can crack the whip when he has to.

Inclined to be on optimistic side. Takes the view that we're not as far behind the Russians in space matters as some "Cassandra" would have us believe. Figures we're about a year behind the Soviets now and can overtake them in a couple of years or so.

Makes home now in Alexandria, Va. Has three children: David, Rachel, Cynthia. David, 15, definitely has an "electronic bent," and even girls, 10 and 8, show a flair for mathematics.

Dr. York likes nothing better than to have current events "bull session" with children. A stocky, 5'11", plays golf spasmodically, gets most of exercise taking neighborhood walks, often in tandem with wife Sybil. Religion: Episcopalian.

Is crazy about spicy Mexican-type food, has practically a passion for Chili. Something else he's exceedingly fond of is geography. Pores over maps like most people do comic strips.

Most men, when they've fulfilled social engagement at night, plop straightway in bed when they get home. No so Dr. York. Very often, if he has some kind of Defense problem on mind, will take long walk through the night. Claims he gets in some of "best thinking" then.

In addition to his regular Pentagon station as Director of Defense Research and Engineering, Dr. York keeps busy by being on the following committees: Air Force Scientific Advisory Board, the Army Scientific Advisory Board, and the President's Science Advisory Committee.

ADMIRAL ARLEIGH A. BURKE

Chief of Naval Operations

STARTED out in life as "cowboy." Dad owned 175-acre Colorado ranch. Arleigh always yearned to get away and be a sailor though, ever since he can remember.

When making his coast-to-coast plane trips now looks forward to passing over Colorado, likes to pridefully point down to ranch where he grew up. Gets kick out of listening to old stories of West.

Nothing to report Arleigh Burke has an "Irish temper." He isn't Irish, despite popular assumption. Of Swedish-Dutch descent. His family name originally *Bjorkegren.*

His appointment by Eisenhower as CNO one of all-time Pentagon surprises. He was 93rd on list of line admirals. No one can remember a rear admiral with subordinate command derricked into top job before.

Admiral Burke was one of "young Turks" who participated in the "revolt of the Admirals" in protest against "over-emphasis" on B-36 Air Force program. Was deep in DOD doghouse for awhile.

Married Roberta Gorsuch of Washington, D. C. No children. Probably puts in more working hours at Pentagon than any other individual. Is generally there all day Saturday and at least a half day on Sundays too.

Old cronies still call him "31-Knots," tag given him for the way he liked to speed up his boats just shy of the boiler-bursting point during World War II sorties.

Likes to read, but reading is almost exclusively devoted to Navy literature, much of it directly related to job. Though he can be salty as the next bugy, is generally soft-spoken in approach, probably as popular a CNO as Navy has had in recent years, is now serving an unprecedented third term in Navy's top slot.

Doesn't find time for usual Pentagon-type hobbies, golf, hunting, etc., but when he can "steal away" from official duties becomes practically a one-man do-it-yourself flotilla. Not only designed a home (with Japanese motif) but got himself some power tools from Sears-Roebuck and set about to build it too, on plot of land on Va. side of Potomac.

Arleigh hurt leg when said leg got in way of ax-chopping stroke but he probably wouldn't part with his ship-shape cottage for a double-plated battleship.

Admiral Burke is a member of the following professional societies: American Chemical Society, AICE, American Ordnance Association, IRE, American Society of Naval Engineers, Military Order of the World Wars, Military Order of the Carabas, Iota Alpha, U. S. Naval Institute, Naval Historical Foundation, and the Newcomen Society of North America. ■

Consolidated Diesel

NORMAN I. SCHAFLER, President Consolidated Diesel Electric Corp.

THE PRIME CONTRACTORS should decide first whether they will make or buy a part, before requesting proposals from sub-contractors. If the prime contractor does not know whether the part will be made or bought, or if the whole program is not fixed, less elaborate proposals can be used. The bidder can then be advised so that he can properly evaluate the amount of effort that goes into his proposals.

There have been too many cases where detailed and costly proposals have been submitted to prime contractors when the program is later altered or the prime contractor decides to build the item himself.

Better methods can be developed to advise industry of the needs of weapons system managers. Smaller companies such as ours cannot afford the tremendously large sales organizations required to visit all the prime contractors and become so well acquainted with the purchasing, sales and engineering departments of each of these prime contractor's so as to be aware of all the weapons system contractor's needs.

Turning to government sales, while our organization has been successful in winning bids under advertised procurements, we have viewed with growing misgiving the pressure on the part of Congress to force government agencies to procure an ever-increasing percentage of their requirements through the advertised invitation for bid.

The invitation for bid properly used, is a very efficient means for the government to procure standard, off-the-shelf items. Congress has, however, in its efforts to bring about an increase in the percentage of goods purchased through advertised bids, forced the various government bureaus to extend that procurement procedure into specialized equipment where the engineering content is a significant part of the purchase price and the engineering approach determines the usefulness of the product.

The result has been two-fold: First, medium-sized specialized companies who have made permanent contributions to the military supply system are caught in a squeeze. The costs of maintaining R & D staffs and of providing spare parts, logistics, and field service organizations place them under a very definite handicap when they have to compete purely on a price basis with manufacturers who are simply looking for business to cover current overhead and who have no intention of becoming a permanent supplier of contributing technical advances to the state of the art.

Second, there has been a definite deterioration in the type of equipment the government has been receiving. More and more business has been going to companies who have no particular concern for the future development of a specialized type equipment.

Their sole desire is to build the minimum equipment which is acceptable under current standards. On the surface, the government is getting the equipment it wants at the most attractive price. In effect, however, it is like buying in a bargain basement sale — where there are no returns, no warranties, no service. *For immediate economy the government is buying long-term extravagance.*

In order to become a low bidder in wide-open competition, the contractor almost has to offer the minimum equipment that would meet the specifications. There is no room in his price for the addition of refinements that might result in ultimate savings to the government

For example, Consolidated Diesel make many specialized items used in the support of missiles. With all of these items, price competition prevents us from offering refinements which would increase reliability and ease of operation and maintenance.

Another aspect of the problem is that after a contractor has successfully completed two or three contracts for a given piece of equipment and has gained some experience which will enable him to build the units better and faster, he finds that another contractor without cost experience has looked at his last price and has bid 10% below and won the next contract for the same equipment. The government cannot continue to rely on transient bidders who come in to cover their overhead when their workload is low and who offer no spares stock, field support, or advances in engineering techniques.

As a result the government, for a negligible price consideration, loses the technical experience of the first contractor. If the second contractor has bid low because of ignorance of the problems involved, both he and the government face the problems of a loss contract – possible late delivery, necessity for production short cuts, requests for price relief, and so on.

I realize that there may never be a solution that would satisfy all parties. I believe that the recent Air Force technique of two-stage bidding (Confining the bidding to a select group — Ed.) is a step in the right direction if some way can be found to speed up the procedure. The military should fully consider the equipment they are procuring, and if they find that it requires new engineering contributions and is a specialized part that does not have widespread application and is therefore being built by a small segment of industry, they should not give in weakly to the pressures for advertised bidding, but should defend their position that an evaluation of bids as well as price will produce the best buy.

Lockheed

R. R. KEARTON, Asst. General Manager, Administration, Missile and Space Division.

In my opinion the nation's defense will continue to be a partnership between the political leaders, the military and industry. This is the system that has been evolved by history. It is working for us now and there is no reason to start making changes.

I'm sure that we can all agree that there are some "bugs" in our present system. There is a need for more

clearly defined channels of authority, more efficient and rapid interchange of information, more time saving techniques of management—and certainly we need a less sporadic program of funding.

Unfortunately difficulties that arise seem to be more newsworthy than steady achievement. Ever since the first Sputnik, we have tended to be hypercritical of every delay and anything that falls short of its announced goal. We should not get panicked into changes in our basic approach to the problem built upon the firm—and successful—partnership of industry and government.

SOLVING PROBLEMS

Like most organizations, Lockheed has faced many problems. I will not pretend that these problems have not been the cause of soul searching and loss of sleep. Nevertheless, in retrospect, I can say that we have found in every case that an application of reasonableness and those qualities which are generally accepted as good human relations have seen us through each of our difficulties.

Now as to the future—

I think it will place an increasing emphasis on quality. Success will depend upon the quality of scientific talent and management brain power possessed by the individual companies. It will depend upon the finest quality workmanship and reliability.

Large weapon systems in the future will continue to be more and more costly and complex. The missions that they will be called upon to fulfill will be as difficult, exciting and imaginative as those of the past few years. Indeed, we will be asked to change the awe-inspiring into the commonplace.

This emphasis on highly complex tasks will place a greater and greater responsibility on industry and upon those who select individual companies for assignments. I think that we might as well face the fact that *the industrial men are going to be separated from the boys.*

INTERESTING THE GOVERNMENT

We have the strong conviction that our organization can interest the military or other government agencies only when we can demonstrate both technical and management capabilities which match their requirements. It is and will continue to be ridiculous for a company to attempt to see new ideas only because they want to be in the defense business. They must offer their potential customer more than just ambition.

In my opinion this will not be so much a matter of big business and little business. It will be the more capable companies against those of less proven ability. *There will be room for the best little companies and the best big companies, but there will be no place for those that offer anything less.*

COMPANY RESEARCH

The research of our nation's industry cooperating with government agencies is at the heart of our nation's ability to develop our future defense and properly explore the realm of space and its many uses. Some of this research today is being supported by company funds—much of it is also being supported indirectly

SCHAFLER
(Consolidated Diesel)

KEARTON
(Lockheed)

and directly by government funds. This is a vital need and should be continued at the highest possible level. This applies both in the area of prime contracts as well as subcontracts.

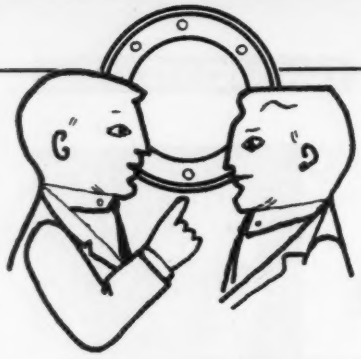
If one asks the question "Will industry continue on the planning as well as the hardware team?" My answer is a resounding *yes!* Industry most certainly will continue to play an important role in the planning of the nation's defense. The rapid spread of the technological revolution has reached a point where the nation's scientific talent must be in the forefront of defense planning. Most of our reservoir of scientific manpower is in industry or educational institutions.

FUTURE DEFENSE

With each passing decade our industrial . . . and of late . . . scientific capability, has played an increasingly significant role in matters of defense. There is no reason to predict a change in this trend. On the contrary, we can feel sure that advance scientific and production ability is becoming more and more the dominant factor in our planning.

More than 45% of our sales dollar has been devoted to the efforts of subcontractors. The subcontractor's contribution to the over-all industrial team as it applies to our programs is equally significant and necessary. Our ability to deal with both management and technical problems of the over-all system depends on the ability of our subcontractors.

Admittedly, there have been some objections to weapon systems management concept of doing business. But it does not follow that we are about to return to the arsenal system of forging steel and bending tin. The advantages of assigning prime responsibility to a private concern offers too many advantages to be ignored. ■



PORTHOLING*

DATA turns to a contractor for its interview this edition.

**Sometimes if you discuss your thoughts with a buddy outside the Captain's cabin, he hears you through the porthole and can take some appropriate action. Now mind, you never asked the Captain to do anything directly . . .*

This month's porthole commentator is R. W. Sweet, Washington representative for Bendix Computer. The buddy is DATA. Curtain rising . . .

You know, I can see both sides of the picture in dealing with the Government. I was in the Government too for awhile. I was a physicist and interested then in the problems of procuring needed and necessary equipment . . .

I know that the Government has to establish certain rules and regulations, in fairness to one and all. I think there are certain changes though that could be made that would be beneficial . . . I think the emphasis should be more *on job performance* rather than *machine specifications* . . .

Of course, sometimes this will dovetail. One spells out the other. But quite often the required job can be done with a machine even if the specifications of the machine are different. And this I think should be the No. 1 criterion. What difference does it really make if tubes in a certain machine are blue instead of pink or wires are $\frac{1}{16}$ of an inch thick instead of $\frac{1}{20}$th if this machine will do the job that an agency wants? And if a Government bureau finds that it can get a machine that will do the job it wants, and at a more economical cost than some specified machine, then this should be the equipment purchased. It'll probably save time, it certainly will save money and it is a realistic and practical way of doing business . . .

I find, on the whole, that the people in the Government procurement end of things are likely to be more knowledgable about new products, such as computers, for instance, than private concerns. I am speaking here of the smaller concerns primarily, not the big corporations. This is understandable; smaller concerns can't always afford the staff to keep pace with the new things. There is more of a problem quite often in explaining the workings of equipment to these companies than the Government people. But the selling of something to Government is just as tough. That's because there is so much competition.

In theory, you should be able to make a sale quicker to a private concern—less red tape. It doesn't always work out that way. A private concern may only look at one machine, and finally buy that one, while the Government, following rules and regulations, is inspecting a half dozen but there may be no difference in the length of time in making the sale because the private concern is finding it difficult to make the decision whether to invest what may be a considerable amount of money for it in some innovation.

A lot of paper work is inevitable in Government, its the nature of the beast, but *what might streamline negotiations for everyone's benefit would be the decentralization of purchases, giving Government establishments out in the field more authority on the procuring end, avoiding the extra step of having to go through some headquarters department too.*

There does seem to be some trend in the Government toward job performance rather than machine specification emphasis and toward decentralization too . . .

—R. W. Sweet/Bendix

DATALOG OF MISSILE, SPACE, AND DETECTION PROJECTS

MILITARY MISSILES, May 1960

★ *New information this month*

AA—Air-to-Air
AS—Air-to-Surface
AU—Air-to-Underwater
SS—Surface-to-Surface
SA—Surface-to-Air
SU—Surface-to-Underwater
UU—Underwater-to-Underwater
ICBM—Intercontinental Ballistic Missile
IRBM—Intermediate Range Ballistic Missile
ECM—Electronic Countermeasures

ARM AF

Type: AS
No contracts announced.
★ New Anti-Radar Missile now in early study phase. FY '60 funding is $23 million.

ARROW Army

Type: AS
prime: Grand Central Rocket
guide: Unguided
power: Grand Central Rocket

Fired from helicopter or a/c. Powered flight to 5000 ft., coasts to 120,000 ft. Enters target area vertically, making it hard to spot and destroy. Ideal surprise attack missile.

ASROC Navy

Type: UU
prime: Minn.-Honeywell
★ Solid rocket-powered nuclear torpedo. Sked. for fleet use Jan. '61. Launched from underwater, ASROC surfaces—flies to target and submerges to hit.

ASTER Navy

Type: SU
prime: Applied Physics Lab/Vitro
guide: Ford
power: Allegheny/Rocketdyne
range: 30 mi.
★ Ship launched TERRIER will carry ASTER torpedo to surface destination, where torpedo would drop off for attack. May replace SUBROC. Now in R&D.

ASTOR Navy

Type: UU
prime: Westinghouse
★ Now in R&D. ASW Nuclear rocket torpedo.

ATLAS SM-65 AF

Type: ICBM
prime: Convair
guide: GE/Burroughs/Am. Bosch
power: North American
weight: 260,000 lbs.
length: 75 ft.
dia: 10 ft.
range: 5500 naut. mi.
★ ATLAS coffin launching complex now operational at Vandenberg AFB. Second coming soon at Warren AFB, Calif. Rocketdyne's new MA-3 propulsion system has passed AF test. The lighter, more powerful system will power advanced series "E" Atlas.

BOMARC IM-99 AF

Type: SA
prime: Boeing
guide: Westinghouse
power: A—Marquardt
B—Thiokol
funding: $421.5 million on BOMARC-B in FY 61
speed: Mach 2.7
range: 500 mi.
★ Two successful firings futile. BOMARC on the way out.

BULLPUP ASM-N-7 Navy GAM-82-A AF GAM-83-A

Type: AS
prime: Martin
guide: radio command/Republic
power: Thiokol
weight: 250 lbs.
range: 2.5 mi.
★ More BULLPUP birds in production with pre-packaged liquid fuel power plants, designated GAM-83-A.

CLAM AF

Type: AS
power: Ramjet
No contracts announced.

Chemical Low Altitude Missile listed in AF missile specifications book. Possible use as target drone.

CLAYMORE Army

Type: SS
No contracts announced.
★ Tactical anti-personell rocket. This hand weapon is in dvlpmt for field use.

COBRA USMC

Type: SS
prime: Boelkow Entwicklunger, W. Germany (distrib. U.S.: Daystrom)
guide: wire guided
power: Solid BE
weight: 24.6 lbs.
speed: 191 mph.
range: 1 mi.
★ Daystrom is turning out 1000 COBRAS a month for USMC. Army is forcing competition between COBRA and Nord's SS-11, in its evaluation of both.

CORPORAL SSM-A-17 Army

Type: SS
prime: Firestone
guide: Gilfillan
power: Ryan
speed: Mach 3.5
range: 75 mi.
★ SERGEANT has pulled rank on CORPORAL. Complete phasing out of CORPORAL under way with more SERGEANT production.

CORVUS XASM-N-8 Navy

Type: AS
prime: Temco
guide: Texas Instrument
power: Reaction Motors
range: Over 100 mi.
★ Several thousand CORVUS birds will be produced. Used against shore targets with capability of homing on enemy radar. Will be carried by F8U-2N fighter.

CROSSBOW AF

Type: AS
prime: Northrop

Now in dvlpmnt. Homes on enemy radar.

MILITARY MISSILES, May 1960

★ *New information this month*

DAVY CROCKETT Army
Type: SS
prime: Rock Island Arsenal
★ Bazooka-launched, can be hand-carried or truck mounted. Has low nuclear yield warhead. DAVY CROCKETT has alternate range by switching launching tubes.

EAGLE JAAM-N-10 Navy
Type: AA
prime: Bendix
guide: Bendix/Sanders
power: Aerojet
speed: Mach 4
range: 100 mi.
★ Competition for launching a/c narrowed to Vought and Grumman, with modified A2F a possibility.

FALCON GAR-1, -2, -3, -4, -9, -11 AF
Type: AA
prime: Hughes
guide: Hughes
power: Thiokol
speed: Mach 2+
range: 5 mi.
★ GAR-3 is operational, SUPER FALCON GAR-3 in test. GAR-2 and 4 are Infrared guided. GAR-9 is radar guided with nuclear warhead. Longe range GAR-9 now being cut back in production. GAR-11 soon to be installed on F-102 Delta Daggers, giving them nuclear capability. F-102 will also carry GAR-10 and GAR-2A.

GENIE MB-1 AF
Type: AA
prime: Douglas
guide: Hughes
power: Aerojet
speed: Mach 4
range: 1.5 mi.
★ Now being carried by F-89J, F-101B and F-106. First operational nuclear warhead air-to-air bird, GENIE is pointed downward at launch, curves up at target. Being replaced by guided FALCON missiles.

HAWK M-3 Army
Type: SA
prime: Raytheon
guide: Raytheon
power: Aerojet
range: 22 mi.
★ FY '60 funding $127 million, of which a large part will go to dvlp advanced HAWK with better performance.

HONEST JOHN M31, XM50 Army
Type: SS
prime: Douglas
guide: unguided
power: Hercules Powder/Thiokol
range: 12 mi.
Operational with U.S. forces in Europe. Little John to replace Honest John for less than maximum ranges. XM50 is increased ranged M31 with greater accuracy.

HOUND DOG GAM-77 AF
Type: AS
prime: North American
guide: Autonetics
power: Pratt & Whitney (J52)
funding: $170 million in FY61
speed: Mach 1.7
range: 500 mi.
★ Comparable Soviet missile is said to be USSR's KOMET D. Longer range version is two-stage XGAM-87A, now in R&D.

JUPITER SM-78 Army-AF-NASA
Type: SS
prime: Chrysler
guide: Ford Instrument
speed: Mach 10
power: Rocketdyne
range: 1,500 mi.
★ Operational with Army and with SAC. Receiving FY '60 funding from NASA as space launch vehicle. Score to date: 22 successes, 5 partial, 2 failures.

LACROSSE SSM-A-12 Army
Type: SS
prime: Martin
guide: Federal Tel.
power: Thiokol
speed: Mach 2
range: 20 mi.
★ LACROSSE is operational, now in Germany—with two battalions forming part o fthe NATO shield. It is multi-purpose in that it can be used against open troops as well as fortified targets.

LITTLE JOHN Army
Type: SS
prime: Emerson Elec.
guide: unguided
power: Hercules Powder
range: 10 mi.
★ Limited operational use with troops. Funding for FY '60 $38½ million.

LOBBER Army
Type: SS
range: 15 mi.
Designed for attack and supply missions.

LOKI Army
Type: AS anti-tank
prime: Grand Central Rocket
guide: unguided
power: Grand Central Rocket
Helicopter-launched anti-tank weapon. Fixed fins. Needle-nosed warhead .

LULU Navy
Type: AU
No contracts announced.
Air dropped nuclear warhead anti-sub missile is highly classified by Navy. Now undergoing development. No contract announced.

MACE TM-76 AF
Type: SS
prime: Martin
guide: AC Spark/Goodyear
power: Allison (J33-A-41)
funding: $39.8 million in FY 61. No renewal.
range: (B) 1200 mi.
★ Funding for MACE, FY '60; $100 million.

(3rd Sheet) **DATALOG OF MISSILE, SPACE AND DETECTION PROJECTS**

MILITARY MISSILES, May 1960

★ *New information this month*

MAULER Army
Type: SA
prime: Convair
★ Anti-missile missile for field use. Truck mounted. Second phase contract has been awarded to Convair: $5½ million.

MINUTEMAN SM-80 AF
Type: ICBM
prime: Boeing
guide: Autonetics/North American
power: Tiokol/Aerojet/Hercules Powder
★ AF will spend much of $500 million cut back from BOMARC and other programs on MINUTEMAN. Total of $390 million to be spent in FY '61.

MISSILE A Army
Type: SS
No contracts.
range: 70 mi.
★ Delay in contract announcement due to proposals to combine MISSILE A with MISSILE B.

MISSILE B Army
Type: SS
No contracts
Range: 10-20 mi.
Will replace LITTLE JOHN. Still in dvlpmnt stage.

MISSILE C Army
Type: SS
No contracts
range: 70-90 mi.
Similar to SERGEANT. In dvlpmnt.

MISSILE D Army
Type: SS
No contracts
Range: Over 500 mi.
Now in early dvlpmnt. PERSHING will fulfill mission of MISSILE D.

NIKE-AJAX SAM-A-7 Army
Type: SA
prime: Western Electric
guide: Western Electric
power: Hercules Powder
speed: Mach 2.5
range: 25 mi.
Operational in U. S., Europe and Far East. Being replaced by NIKE-HERCULES. Non-nuclear.

NIKE-HERCULES SAM-A-25 Army
Type: SA
prime: Western Electric
guide: Western Electric
power: Hercules/Thiokol
funding: $111.4 million in FY 61
speed: Mach 3.2
range: Over 75 mi.
Work continuing rapidly on conversion of NIKE-AJAX sites to NIKE-HERCULES. This fine weapons system appears slated for long retention in our anti-aircraft protection arsenal. Nuclear head.

NIKE-ZEUS XSAM-A-25C Army
Type: SA
prime: Western Electric
guide: Bell Telephone
power: Grand Central Rocket/Thiokol
range: 200 mi.
Altho still plagued with difficulties in reliability, NIKE-ZEUS is still on sched but DOD witholds funds for further evaluation.

PERSHING Army
Type: SS
prime: Martin
guide: Bendix
power: Thiokol
range: 100-300 mi.
★ New $82½ million contract to Martin for additional R&D. Total FY '60 funding is $131.6 million.

POLARIS FBM Navy
Type: US-SS
prime: Lockheed
guide: GE
power: Aerojet
range: 1200 mi.
★ Successful tests under full guidance have been made. Firings of dummy POLARIS, 'DOLPHINS', underway to train crew prior to operational status. Expect at least one POLARIS sub to be operational in '60. Advanced program underway to increase accuracy. Movable nozzles are being dvlpd for this purpose. Score to date: 43 successful, 17 partial, 2 failures.

QUAIL GAM-72 AF
Type: AS-ECM
prime: McDonnell
guide: radio command/Summers
power: GE (J85)
Air-launched diversionary missile of extreme sophistication and complexity is valuable aid in protection of SAC bombers.

RAVEN XASM-9 Navy
Type: AS
No contracts announced.
range: 500 mi.
Proposed air-to-surface range: 500 mi. missile now under study. Project appears to be lagging.

REDEYE Army/USMC
Type: SA
prime: Convair
guide: Convair
power: Atlantic Research
★ Lightweight (18 lb.) infra-red guided bazooka-type missile. Army has high hopes for this relatively inexpensive and effective, easily-carried guided missile that can be fired from a soldier's shoulder, giving him better antiaircraft capability than ever before.

REDSTONE SSM-A-14 Army
Type: SS
prime: Chrysler
guide: Sperry Rand
power: Rocketdyne
speed: Mach 5
range: 250 mi.
Now operational with U. S. troops in Europe. REDSTONE now equipped with TV for bird's eye view of battle.

REGULUS I SSM-N-8 Navy
Type: SS
prime: Chance Vought
guide: AC Spark Plug
power: Allison (J33)
range: 500 mi.

MILITARY MISSILES, May 1960

★ *New information this month*

Although cut in production, REGULUS I is aboard some ships and subs of the U. S. fleet and is operational. Biggest news with REG I, however, is not its current Navy dress but the fact that it has been used in "missile mail" tests by the Post Office Dept.

REGULUS II SSM-N-9A Navy

Type: SS
prime: Chance Vought
guide: Stavid/Sperry/AC
power: GE (J79)
range: 500 mi.

Much more powerful and larger version of REGULUS I, REG II has also been cut from Navy funding but also is being eyed by Post Office Department as speedy ("beyond Mach 2") missile mail carrier that could fly in any weather. Now being used in fleet as target drone.

SERGEANT SSM-A-27 Army

Type: SS
prime: Sperry
guide: Sperry
power: Thiokol
range: 75 mi.

★ Easily assembled in field in about 11 minutes, smaller, more flexible solid propellant SERGEANT is now in production to replace Army's CORPORAL. Will be operational this year.

SHILLELAGH Army

Type: SS
prime: Aeronutronics
guide: Aeronutronics
power: Picatinny Arsenal
range: 8 mi.

★ Tank-mounted with complex guidance system. Ideal for close-in support of troops. Still in dvlpmt.

SIDEWINDER AAM-N-7 Navy GAR-8 AF

Type: AA
prime: Philco
guide: Philco/GE
power: Hercules Powder
range: 7 mi.

★ Extremely popular infra-red homing missile is simple and rugged. SIDEWINDER-1C is advanced model with higher speed and greater range. Advanced model has interchangeable warhead—one with infrared guidance (IRA), the other with radar guidance (SARAH). All weather type SIDEWINDER, to be used on PHANTOM-2 fighter, now in R&D. Earlier models have been purchased by Jap Air Force.

SKY BOLT GAM-87A AF

Type: AS
prime: Douglas
guide: Nortronics
power: Aerojet
range: 1000 mi., a/c launch

★ This two stage, solid propellant missile will be a great aid to SAC. Test flights in process.

SLAM AF

Type: SS
No contracts announced.

★ Supersonic low altitude missile, big brother of CLAM Contractors now being selected.

SPARROW III AAM-N-6, 6A Navy

Type: AA
prime: Raytheon
guide: Raytheon
range: 5-8 mi.
power: Thiokol/Aerojet

★ With pre-packaged Thiokol powerplant, top Navy officials feel "SPARROW III is finest electronically guided missile in the world." It is designed for use on PHANTOM 2 fighter. USMC will also eventually use this bird.

SS-10 Army

Type: SS
prime: Nord of France
weight: 33 lbs.
range: 0.9 mi.

Wire guided anti-tank weapon. Operational with U. S. and NATO forces. Used by the French in Algerian battles with success.

SS-11 Army

Type: SS
prime: Nord of France
weight: 62 lbs.
range: 2 mi.

Can be carried and launched by helicopter as well as by troops in field using wire guidance. Operational with French forces. Under study by U. S. Army.

SUBROC Navy

Type: SU-UU
prime: Goodyear
guide: Librascope/Kearfott
power: Thiokol
range: 25-50 mi.

This complex weapons system is launched through a torpedo tube of a submarine or surface vessel. Rising, it flies from 25 to 50 miles through the air, then re-enters the water and homes on its submerged target. Key to perfection of the system is reliability and range of built-in sonar equipment. Work is now continuing along that line.

T-238 Army

Type: SS
No contracts announced.

★ Short-range mobile poison gas rocket. T-238 will be launched from truck-mounted tubes.

TALOS SAM-N-6 Navy

Type: SA
prime: Bendix
guide: Bendix/AVCO
power: McDonnell
speed: Mach 2.5
range: 65 mi.

Unique in its integral ramjet body, TALOS is now operational aboard the guided missile cruiser GALVESTON.

TARTAR Navy

Type: SA
prime: Convair
guide: Sperry
power: Aerojet/Rocketdyne
speed: Mach 2.0
range: 15 mi.

Now has new electric boost by Rocketdyne. TARTAR is sched to be operational this year. Test firings underway in Pacific waters. Jap Govt will buy 42 TARTAR missiles.

(5th Sheet)

DATALOG OF MISSILE, SPACE AND DETECTION PROJECTS

MILITARY MISSILES, May 1960

★ *New information this month*

TERRIER SAM-N-7 Navy

Type: SA
prime: Convair
guide: Sperry
power: Allegheny/Rocketdyne
speed: Mach 2.5
range: 10 mi.

Beam riding missile for use on larger surface ships, TERRIER has new electronic booster like cousin TARTAR. Operational with the fleet. Advanced TERRIER missiles now in increased production.

THOR SM-75 AF-NASA

Type: IRBM
prime: Douglas
guide: AC Spark Plug
power: North American
range: 1500 mi.

★ Now operational. RAF THOR units now complete with 60 birds. In its role as a research vehicle, THOR has served as an effective first stage booster, most capably shown in the THOR-ABLE lunar probe combo.

TITAN SM-68 AF

Type: ICBM
prime: Martin
power: Aerojet
range: 5500 mi.
guide: Bell/Am. Bosch/Sperry Rand

★ Test facility at Vandenberg will be ready soon. TITAN program now moving along nicely.

TYPHON Navy

Type: SA-SS
range: 20 and 100 mi.

★ Under dvlpt. by Navy. New name for SUPER TALOS (long range TYPHON) and SUPER TARTAR (medium range TYPHON).

WAGTAIL AF

Type: AS
prime: Minn-Honeywell
guide: Minn-Honeywell
power: not releasable

This remarkable rocket will be able to follow contours of terrain and change speed in flight. WAGTAIL has been successfully sled-tested.

WEAPON ALPHA Navy

Type: SU
No contracts released.
BuOrd "in-house"

Operational with the fleet, WEAPON ALPHA is rocket-powered depth charge now installed on destroyer escorts and class 931 frigates.

WHITE LANCE GAM-83B AF

Type: AS
prime: Martin
guide: radio command Republic
power: Thiokol

★ Larger model of Navy BULLPUP for AF use. Now in dvlpmnt. FY '60 Funding $6½ million.

WILLOW Army

Type: SS
prime: Chrysler

★ All information on this missile is highly classified.

ZUNI Navy

Type: AS-AA
No contracts released.
range: 5 mi.

Operational with carrier based a/c, ZUNI is a folding fin all-weather unguided rocket carried in multiple units. The Douglas AD a/c carry 48 ZUNIs below their wings on combat missions. The weapon is effective against pill-boxes, tanks, gun emplacements and small ships.

SPACE PROJECTS, May 1960

AGENA ARPA

Type: Liquid-fueled Upper Stage
prime: Lockheed
Obj: AGENA will be useable as a second stage to ATLAS and THOR missiles. It incorporates a Bell rocket engine similar to that used previously in the HUSTLER vehicle. The AGENA upper stage is used in DISCOVERER, MIDAS and other projects. AGENA and SATURN are part of PROJECT TRIBE.

AGENA B AF/NASA

Type: Liquid Fuel Upper Stage
prime: Lockheed
obj: Deep Space Missions

★ ATLAS-AGENA B moon shot sched for mid '61. It will TV moon and land instrument capsule to tell NASA about the makeup of the moon. Ford has contract for capsule. Shot with THOR sched this summer by AF. NASA will buy 16 Agena-B launch vehicles for $50 million.

ASTROBEE AF

Type: Space Probe Rocket
Obj: Designed for short-range space-probes

★ Shot of March 23 failed. Its goal was an alt. of 515 miles, but the 26 ft. rocket fell apart shortly after launch.

ATLAS-ABLE NASA

Type: Large Booster
prime: Convair/Space Tech Labs
guide: GE/Burroughs/Am. Bosch
power: Rocketdyne/Aerojet
Obj: Designed to orbit 200-lb. satellite around moon.

★ 2 ATLAS-ABLE shots are sched for late '60. Both aimed at lunar orbit. Project going well, with much interest in this combo.

CENTAUR NASA

Type: Soft-Land Moon Vehicle
prime: Convair
guide: Minn-Honeywell
power: P&W/JPL
1st stage: Hi-energy Atlas
2nd stage: 2 P&W liquid hydrogen engines

SPACE PROJECTS, May 1960

★ *New information this month*

3rd stage: JPL 6000 lb. thrust liquid engine

Obj: Designed to land 730-lb. payload on moon in soft landing. for havy earth satellites and probes to Mars and Venus.

★ Static tests beginning around 1 June. Full firing due early '61.

COURIER ARPA (Army)

Type: Communications Satellite
prime: Philco
Obj: Designed to be delayed repeater satellite, part of PROJECT NOTUS.

★ Shot now sched for July. Repeated delays in launch schedule.

DECREE ARPA (Army)

Type: Global Communications Satellite
prime: no contracts announced
Obj: Designed to be global real-time repeater with satellite remaining at stationary distances from each other.
repeaters remaining stationary distances from each other.

Part of NOTUS, will be transferred from ARPA to Army eventually.

PROJECT DISCOVERER AF

Type: Stabilized Satellites

Obj: (a) Achieve orbital capabilities of large satellite vehicles.
(b) Dvlp tech for operational military satellite systems.
(c) Recover by use of suitable re-entry capsule for biomedical and other studies.
(d) Execute nonrecoverable advanced engineering tests.
(e) Such other objectives as may be directed.

Tasks: **DISCOVERER** satellites
Prime: Lockheed
Has achieved orbit 6 times in 10 tries and has made successful re-entries. Ejected capsules have not been recovered.
MIDAS Satellites
Prime: Lockheed
Now in test-flight stage of dvlpmnt. Early Warning Satellite dvlpd to spot enemy ICBM launchings by infra-red.
SAMOS Satellites
Prime: Lockheed
Not yet ready for flight. Orig. sched for March.

DYNA-SOAR I AF/NASA

Type: Boost-Glide Orbiting Vehicle
prime: Boeing (for Glider)
Martin (for Booster)
guide: not announced
power: not announced
Obj: Manned glider for robit and re-entry

★ AF has decided glider is practical. FY '59, '60 funds totaling $29.7 million have been released. Total project will cost $80 million. Boeing will now begin construction of winged glider.

PROJECT ECHO NASA

type: Inflatable Satellites
Obj: Global communications experiment.

★ THOR-DELTA as launch vehicle for first attempt of 5 May, postponed due to technical problems in launch.

IRIS NASA

Type: Sounding Rocket
prime: Atlantic Research
Obj: Designed to put 100 lb. payload at 185 mi. altitude.

★ This rocket. apx 13 ft. long and 1 ft. in diameter will be launched this spring.

JUNO II NASA

Type: Large Booster
prime: Chrysler
guide: Ford Instrument
power: Rocketdyne/JPL
Obj: Attempts to put small payloads in space.

Project to be completed, 1960.

LITTLE JOE NASA

Type: Test Vehicle
prime: North American
power: Thiokol
Obj: Test Vehicle for Mercury
alt: 55 mi.
dist: 200 mi.

LITTLE JOE hasn't failed yet. Twice has carried monkeys in capsule.

MERCURY NASA

Type: Manned Satellite
prime: McDonnell
Obj: Will attempt to put man in brief orbit, then parachute him in capsule safely to earth.
guide: not announced
power: ATLAS (Rocketdyne)

★ Project moving fast with escape system tested at sea. Dramatics by NASA in attempt to raise public interest. REDSTONE rockets will use JUPITER C fuel tanks to increase range.

MIDAS WS 117L AF

Type: Early Warning Satellite
prime: Lockheed
Obj: Infrared sensing of enemy ICBM launchings.

★ Vehicles in orbit will weigh 5,000 lbs. Later models aimed at higher orbits will weigh 3,000 lbs. in orbit. At least 5 years until MIDAS is operational. First launch failed.

MRS. V ARPA

Type: Maneuverable, Recoverable Manned Space Vehicle
No contracts announced
Obj: Will attempt to place manned vehicle in orbit, then maneuver out of original orbit in space, then return safely to earth.

This project is also known as DYNA-SOAR II. Vehicle will weigh in excess of 20,000 lbs. Launch may be from or to space.

NIMBUS NASA

Type: Meteoroligical Satellite
Obj: Designed to take television pictures of cloud formations and frontal systems.

Follow up satellite for TIROS. Will be in circular polar orb. Earth oriented. Later models will have spectrometer and radar.

(7th Sheet) **DATALOG OF MISSILE, SPACE AND DETECTION PROJECTS**

SPACE PROJECTS, May 1960

★ *New information this month*

NOVA NASA

Type: Large Booster
prime: Rocketdyne
power: Rocketdyne
Obj: Will build 6-12 million lb. thrust booster for Outer Space

Rocketdyne's 1.5 million lb. thrust engine is heart of this system. NOVA will be cluster of 4 - 6 such engines. Engine in early dvlpmnt now, sched for operation after 1965.

ORION ARPA

Type: Rocket propelled by nuclear pulses
prime: General Atomic
Obj: Nuclear powered Outer Space Vehicle

★ Now under AF jurisdiction only. Moving into basic testing stage. Apx $2½ million spent to date.

PRINCIPIA ARPA

Type: Solid Propellants
prime: no contracts announced
Obj: Dvlping new solid propellants with 10-20 percent higher specific impulses.

PONTUS ARPA

Type: Material Research
prime: no contracts announced
Obj: Experimentation and dvlpmnt of better structural and power conversion matls for military requirements in surface, air and missile programs.

PROJECT RANGER NASA

Type: Lunar Probe
prime: Jet Propulsion Lab/Aeronutronics
Obj: Hard landing of instruments on moon

800 lb. ATLAS-AGENA B will launch 300 lb. lunar capsule in mid '61. Aeronutronics has been selected for contract negotiations.

PROJECT ROVER AEC/NASA

Type: Nuclear rocket
Obj: Prove feasability of nuclear rocket

★ Now in R&D. Lockheed has contract to find adequate atom resistant materials. AEC to dvlp powerplant, KIWI-A and advanced KIWI-A3. NASA to procide frame and test combined power-plant, air-frame. $11 million in funds restored to project ROVER. Will see nuclear power-plant by '63.

SAMOS WS 117L AF (via ARPA)

Type: Reconnaissance Satellite
prime: Lockheed
Obj: TV Satellite

★ Delay in launch pad preparation has pushed SAMOS launch sched to late '60.

SATURN NASA

Type: Large Booster
prime: Convair
power: Pratt & Whitney
Obj: Clustered 1.5 million lb. thrust booster for Outer Space Vehicles.

★ Apx. $150 million will be spent in FY '61 on SATURN. With CENTAUR upper-stage, 15 tons could be placed in earth orbit.

SCOUT NASA

Type: Four-stage Satellite Launch Vehicle
prime: Chance Vought
guide: Minn-Honeywell
power: Aerojet/Allegany/Thiokol
Obj: Designed to place 200-300 lb. satellites in orbit.

★ A series of unsuccessful firings from Wallops Island have not dampened project. AF may buy this 4 stage rocket for firing from the Cape after NASA fires successfully. Watch for AF PROJECT 609.

SHEPARD ARPA

Type: Tracking System
prime: no contracts announced
Obj: Tracking and data reduction

★ System will detect and track satellites from Space Surveillance Control Center.

STEER ARPA (Army)

Type: Communications Satellite
prime: Bendix
Obj: Destined to serve the Strategic Air Command for communications purposes, STEER is part of the NOTUS project. STEER will be launched in a polar orbit. Still in R&D. Army will dvlp the satellite, AF will launch it.

SUNRISE ARPA

PROJECT SUNRISE will make studies of advanced military weapons with special concentration on space delivery.

SUZANO ARPA

Type: Space Platform
Obj: Designed to provide space platform for assembling Outer Space Vehicles, and to be used as a springboard base for advanced space missions.
prime: no contracts announced

Project being cancelled for lack of funds and as necessary "must go" in ARPA shake-up.

THOR-ABLE NASA

Type: Large Booster
prime: Douglas/Space Tech Labs
Obj: Designed for deep space probes of lighter payloads than ATLAS-ABLE.
guide: GE
power: Rocketdyne/Aerojet

Good reliability with this combo, as shown by success of PIONEER 5, still sending back information.

THOR-DELTA NASA

Type: Satellite Launching Vehicle
prime: Douglas
guide: ITT
power: Aerojet/Allegany
Obj: Designed to put small satellites (50-80 lbs.) into orbit around moon.

SPACE PROJECTS, May 1960

★ *New information this month*

★ Use as launch vehicle, with first satellite launches mid '60 on TIROS 2 project.

TIROS NASA

Type: Meteorological Satellite
prime: RCA
Obj: Reveal certain aspects of the nature of weather

★ Weather Bureau and NASA are both in agreement that TIROS I was more successful than expected.

TIROS 2 NASA

Type: Meteorological Satellite
prime: RCA
Obj: Provide info on nature of weather

★ TIROS 2 will be much the same as its predecessor TIROS 1 with infra-red photo equipment. Its power will be THOR-DELTA, and it is sched for mid '60.

PROJECT TRANSIT ARPA

Obj: Astro-Geodetic Navigation Satellite

★ Successful launch proved feasability of start, re-start powerplant for rockets. TRANSIT 1B is now aiding air and sea navigators.

PROJECT TRIBE ARPA

Obj: Outer Space Vehicles

PROJECT TRIBE is a research, experimentation and systems dvlpmnt designed to obtain at the earliest practical date a continuing family of military space vehicles capable of satisfying the needs for space missions as may be determined by Secretary of Defense from time to time. Guidance, stabilization and control components necessary to satisfactory performance of the vehicles shall be included in the scope of this assignment. The SATURN Task and AGENA Task are part of Project TRIBE.

X-15 AF/Navy/NASA

Type: Rocket-Powered Manned Aircraft
prime: North American
power: Thiokol
Obj: Designed to take man in controlable a/c to fringes of outer space — 250,000 ft. altitude, at speed of Mach 5 (better than 3600 mph.).

★ North American shooting for modified X-15 with orbital capabilities, may get NASA support.

PROJECT YO YO Navy

Type: Reconnaissance Satellite

Satellite for photo recon. Ship or sub launch.

BALLISTIC MISSILE DEFENSE

BMEWS AF

Type: Ballistic Missile Defense Radar System
prime: RCA
Obj: Ballistic Missile Early Warning System designed for 40-minute notice of approaching enemy ICBMs.

★ Plans for BMEWS England well underway. Construction costs will be paid by the British. Total cost to U.S. for equipment: $81 million.

DETECTION PROJECTS, May 1960

PROJECT DEFENDER ARPA

Obj: Ballistic Missile Defense

ESAR, TRADEX and PINCUSHION are only part of the entire ballistic missile defense program of ARPA. The GLIPAR studies, (Guide Line Identification Program for Anti-Missile Research) is also a part of Project DEFENDER.

ESAR ARPA

Type: Advanced Warning Radar
prime: Bendix
Obj: Electronically Steerable Array Radar is designed for ground installation to warn of approaching enemy missiles. Multitude of individual cells will give more flexibility than other systems of steerable radar.

GLIPAR ARPA

Type: Study Group for Missile Defense
Obj: Designed to work on future ICBM defense. Called upon by DEFENDER and LONGSIGHT.

PROJECT LONGSIGHT ARPA

Type: Study System in Missile/Space Field
Obj: Recommendations as to projects which should be initiated to satisfy future military requirements. GLIPAR (Guide Line Identification Program for Anti-Missile Research) which was initiated. GLIPAR is now used by both LONGSIGHT and DEFENDER. LONGSIGHT more advanced than DEFENDER.

PINCUSHION ARPA

Type: Advanced Radar
prime: Raytheon
Obj: PINCUSHION is a many-frequency radar installation to be located on Kwajalein in the Marshall Islands, initially, as an early warning radar of a more variable type than TRADEX or ESAR.

SAGE AF

Type: Continental air warning and control network
prime: IBM
Obj: Provides a push-button missile defense utilizing a search radar system to locate enemy aircraft and destroy them with integrated BOMARC missiles.

★ SAGE includes air-borne radar by Burroughs. Off shore planes will give sooner warning of enemy attack by air. SAGE is being cut back with BOMARC, but the radar system may be used by FAA for air traffic control.

TRADEX ARPA

Type: Advanced Radar
Prime: RCA
Obj: TRADEX is a modification of the radar types recently designed for BMEWS (Ballistic Missile Early Warning System). It should have better range.

VELA ARPA

Obj: Research, experimentation and systems dvlpmnt related to the nuclear test moratorium.
★VELA Uniform: R&D on sub-surface nuclear explosion detection.
★VELA Sierra: R&D on ground detection of nuclear explosions in space.
★VELA Hotel: R&D on satellite detection of nuclear explosions in space.

★ Funding totals $9,885,000 for FY '60. Broken down, this includes: $8,535,000 for VELA Uniform; $1,050,000 for VELA Sierra; $300,000 for VELA Hotel.

PROJECT TEEPEE ARPA

Type: Long Range, High Frequency Radar
Obj: ★ Provide ICBM detection

DATA 1960 SCHEDULE

JANUARY 1960
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Deadline for advertisements: 20 December 1959

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Deadline for advertisements: 8 February 1960

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THE DEPARTMENT OF DEFENSE
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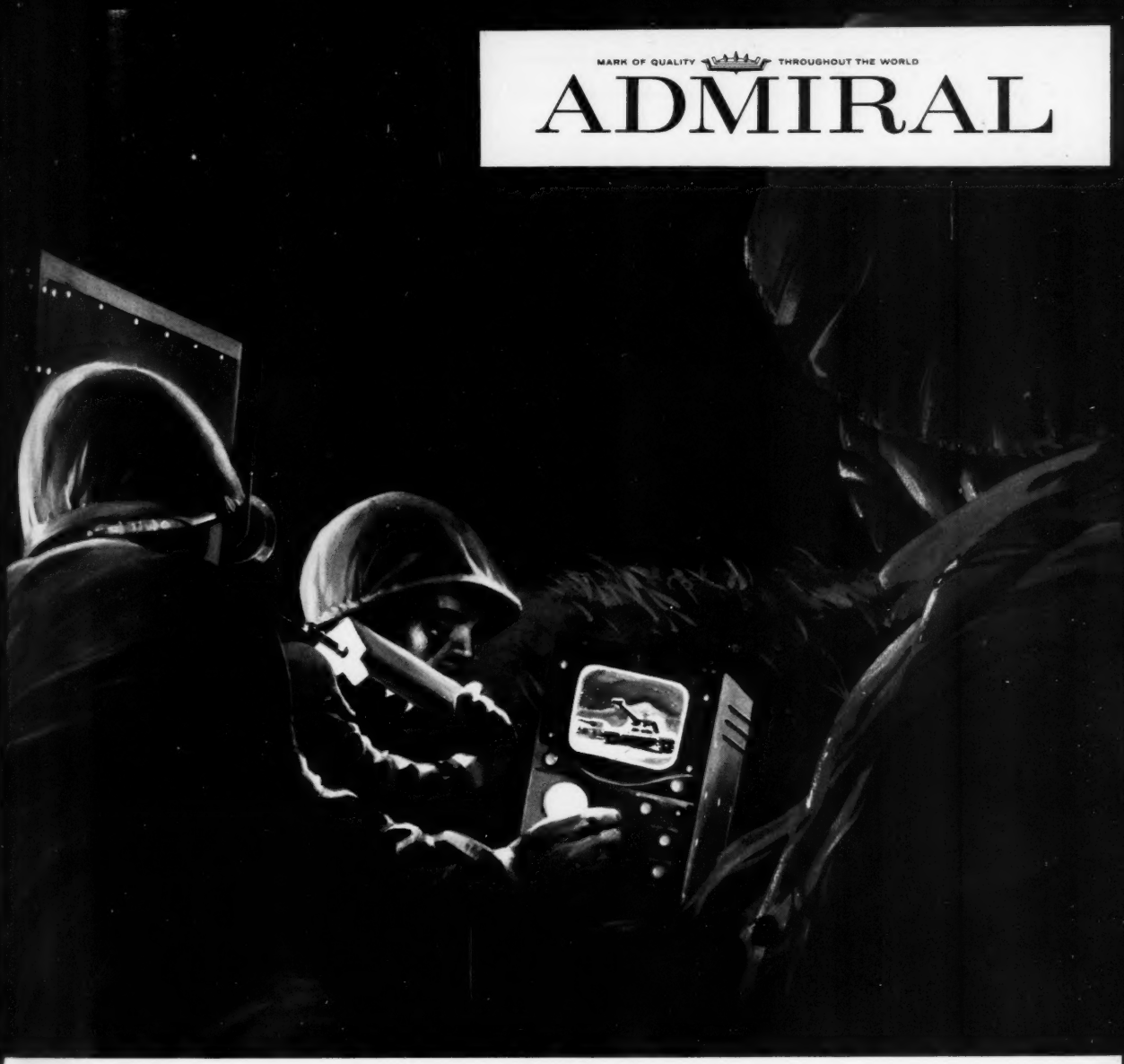

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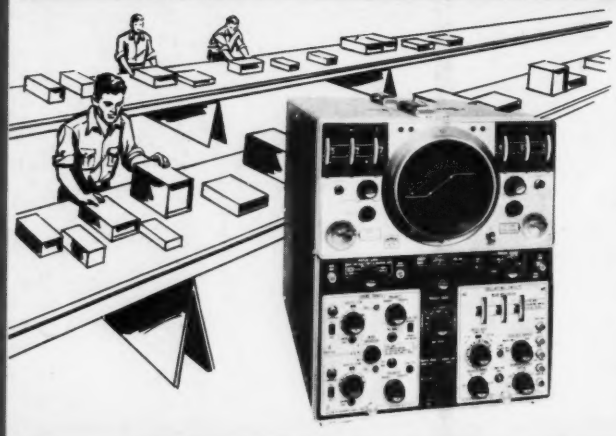

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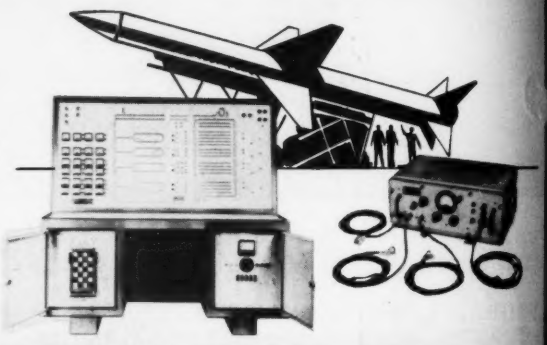

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